

6 2 0001
[6.2]

36871

**TECHNICAL MEMORANDUM REPORT
FOR THE
INORGANICS MONITORING STUDY**

**FIRESTONE TIRE & RUBBER COMPANY SITE
ALBANY, DOUGHERTY COUNTY, GEORGIA**

Prepared for:

BRIDGESTONE/FIRESTONE, INC.

Nashville, Tennessee

**October 20, 1995
May 20, 1996 (Revised)**

ATEC Project 3207-96-00156
TABLE OF CONTENTS

	Page
LIST OF TABLES	iv
LIST OF FIGURES	v
LIST OF APPENDICES	vii
1.0 INTRODUCTION	1-1
1.1 SITE LOCATION	1-1
1.2 SITE DESCRIPTION	1-2
1.3 SITE HISTORY	1-2
1.4 REGIONAL PHYSIOGRAPHY	1-4
1.5 GEOLOGY	1-4
1.6 REGIONAL HYDROGEOLOGY	1-5
1.6.1 Hydrostratigraphic Units in the Albany Area	1-5
1.6.2 Ground-Water Flow Direction in the Albany Area	1-7
2.0 RESULTS OF PREVIOUS INVESTIGATIONS	2-1
2.1 PREVIOUS GROUND-WATER INVESTIGATIONS FOR INORGANICS	2-1
2.1.1 Historic Ground-Water Assessment	2-1
2.1.2 Remedial Investigation Ground-Water Assessment	2-2
2.1.3 Results of Remedial Investigation Ground-Water Assessment	2-4
2.2 PREVIOUS GROUND-WATER INVESTIGATIONS FOR CARBON DISULFIDE	2-6
2.3 CHEMICAL CHARACTERIZATION OF SITE-SPECIFIC SOIL AND SEDIMENT	2-6
2.4 SITE-SPECIFIC HYDROGEOLOGY	2-7
2.4.1 Residuum	2-7
2.4.2 Upper Ocala	2-8
2.4.3 Lower Ocala	2-8
3.0 PURPOSE AND TECHNICAL APPROACH OF THE INORGANICS MONITORING STUDY	3-1
4.0 SCOPE AND RESULTS OF LITERATURE REVIEW	4-1
4.1 GROUND-WATER PURGING AND SAMPLING TECHNIQUES	4-1
4.2 BACKGROUND CONCENTRATIONS OF INORGANICS OF INTEREST	4-2
4.3 POTENTIAL SOURCES OF CARBON DISULFIDE	4-4
4.3.1 Quality Control Data Review	4-5
4.3.2 Natural and Anthropogenic Sources of Carbon Disulfide	4-5
5.0 SCOPE AND RESULTS OF GROUND-WATER SAMPLING ACTIVITIES	5-1

5.1 GROUND-WATER SAMPLING AND ANALYSIS	5-1
5.1.1 Measurement of Water Elevations	5-1
5.1.2 Well Development Activities	5-1
5.1.3 Well Purging	5-2
5.1.4 Ground-Water Sample Collection	5-3
5.1.5 Analysis of Ground-Water Samples	5-3
5.2 RESULTS OF THE GROUND-WATER SAMPLING ACTIVITIES	5-4
5.2.1 Evaluation of Ground-Water Quality	5-4
5.2.2 Evaluation of Ground-Water Flow Direction	5-8
5.3 RESULTS SUMMARY	5-11
6.0 DATA EVALUATION	6-1
6.1 INORGANICS OF INTEREST	6-1
6.1.1 Comparison of Round V and VI Results	6-1
6.1.2 Comparison of RI and Inorganics Monitoring Study Data	6-5
6.2 CARBON DISULFIDE	6-6
6.3 IDENTIFICATION OF BACKGROUND WELLS	6-8
7.0 CONCLUSIONS AND RECOMMENDATIONS	7-1
7.1 INORGANICS OF INTEREST	7-1
7.2 CARBON DISULFIDE	7-1
8.0 REFERENCES	8-1
TABLES	
FIGURES	

LIST OF TABLES

Table

- 2.1 Ground-Water Monitoring Well Summary
- 2.2 Analytical Results from the RI for the Constituents of Interest: Residuum/Transition Zone Wells
- 2.3 Analytical Results from the RI for the Constituents of Interest: Upper Ocala Wells
- 2.4 Analytical Results from the RI for the Constituents of Interest: Lower Ocala Wells
- 4.1 Range of Concentrations of Inorganics of Interest in Background Soil Samples
- 5.1 Ground-Water Elevations
- 5.2 Summary of Ground-Water Quality Parameters
- 5.3 Summary of Analytical Results for Round V Sampling
- 5.4 Summary of Analytical Results for Round VI Sampling
- 6.1 Analytical Results for the Constituents of Interest: Residuum/Transition Zone Wells
- 6.2 Analytical Results for the Constituents of Interest: Upper Ocala Wells
- 6.3 Analytical Results for the Constituents of Interest: Lower Ocala Wells
- 6.4 Range of Concentrations of Inorganics of Interest During Each Sampling Event

LIST OF FIGURES

Figure

- 1.1 Site Location Map
- 1.2 Site Plan
- 1.3 Location Map for the Hydrostratigraphic Cross Section A-A'
- 1.4 Hydrostratigraphic Cross Section A-A'
- 1.5 Summary of Regional and Site-Specific Hydrostratigraphic Units
- 1.6 Potentiometric Surface of the Ocala Aquifer in the Albany Area, November, 1979
- 2.1 Site Plan/Monitoring Well Location Map
- 2.2 Potentiometric Surface, Upper Ocala, December 17, 1991
- 2.3 Potentiometric Surface, Upper Ocala Limestone, June 16, 1992
- 2.4 Potentiometric Surface, Lower Ocala Limestone, December 17, 1991
- 2.5 Potentiometric Surface, Lower Ocala Limestone, June 16, 1992
- 4.1 Antimony Content of Surficial Materials
- 4.2 Beryllium Content of Surficial Materials
- 4.3 Chromium Content of Surficial Materials
- 4.4 Lead Content of Surficial Materials
- 5.1 Ground-Water Sampling Locations - Rounds V and VI
- 5.2 Potentiometric Surface, Upper Ocala Limestone, March 28, 1995
- 5.3 Potentiometric Surface, Upper Ocala Wells, May 22, 1995
- 5.4 Potentiometric Surface, Lower Ocala Limestone, March 28, 1995
- 5.5 Potentiometric Surface, Lower Ocala Limestone Wells, May 22, 1995

LIST OF FIGURES (Continued)

- 6.1 Inorganics of Interest Detected in Rounds V and VI: Residuum/Transition Zone Wells
- 6.2 Inorganics of Interest Detected in Rounds V and VI: Upper Ocala Wells
- 6.3 Inorganics of Interest Detected in Rounds V and VI: Lower Ocala
- 6.4 Carbon Disulfide Detected During Rounds V and VI
- 6.5 Site Vegetation

LIST OF APPENDICES

- A **FIELD PROCEDURES**
- B **BORING LOGS/MONITORING WELL INSTALLATION DIAGRAMS**
- C **CHEMICAL DATA RESULT FORMS**

SUMMARY OF STUDY FINDINGS AND CONCLUSIONS

This document comprises the Technical Memorandum Report (TMR) for the Inorganics Monitoring Study at the Firestone Tire & Rubber Company Site, located in Albany, Dougherty County, Georgia. The TMR was conducted in accordance with requirements set forth in the Record of Decision (ROD), issued by the United States Environmental Protection Agency (USEPA), dated June 24, 1993, and the Third Modification to the Administrative Order By Consent (Modified AOC), dated February 9, 1994. As required by the Modified AOC, the Inorganics Monitoring Study was conducted to investigate the sources and determine the concentrations, including background concentrations, of antimony, beryllium, chromium, lead, (hereafter referenced as the inorganics of interest), and carbon disulfide (CS₂) in ground-water samples obtained from monitoring wells at the site.

Based on the results and conclusions of the Inorganics Monitoring Study, no further action is recommended for antimony, beryllium, chromium, lead, and carbon disulfide in ground water at the site. The results and conclusions upon which this recommendation is based are summarized below:

- The inorganics of interest are not present in ground-water samples obtained from monitoring wells at the site at concentrations exceeding ROD-specified clean-up levels which are based on Safe Drinking Water Act Maximum Contaminant Levels (MCLs) or Action Levels. The following table lists the maximum detected concentrations of the inorganics of interest observed in ground-water samples collected during the Inorganics Monitoring Study.

Analyte	ROD-Specified Clean-up Level (ug/L)	Maximum Concentration Detected (ug/L)	Monitoring Well Reported
Antimony	6	2.8B	MW-1-5A, OW-2
Beryllium	4	1.8BP	BMW-3
Chromium	100	23.9	RW-10A
Lead	15	5.9	RW-10A

Notes:

ROD-Specified Clean-up Levels based on Safe Drinking Water Act (SDWA) MCLs for antimony, beryllium and chromium and the SDWA Action Level for lead

ug/L - micrograms per liter

B - Estimated value. Detected concentration below the Contract Required Detection Limit.

P - Analyte was detected in the associated laboratory preparation blank.

A review of pertinent literature leads to the conclusion that the elevated concentrations of the inorganics of interest observed during previous investigations were due to artificially high levels of naturally-occurring solids in ground-water samples caused by surging of the well during purging.

- CS₂ is not present in ground-water samples obtained from monitoring wells at the site at concentrations exceeding the ROD-specified clean-up level of 56 ug/L which was calculated using a Hazard Index of 1.0 and standard residential exposure assumptions.

The maximum concentration of CS₂ detected in ground-water samples collected during the Inorganics Monitoring Study was 36 ug/L in monitoring well EMG-7. A review of pertinent literature leads to the conclusion that the elevated concentrations of CS₂ observed during the RI were the result of natural processes (for example, anaerobic degradation or production by native plant species), ambient conditions, or laboratory contamination.

The following sections summarize the technical approach used during the Inorganics Monitoring Study, implementation and results of the study, and the conclusions of the study.

SCOPE OF THE INORGANICS MONITORING STUDY

Because none of the inorganics of interest nor CS₂ was used in the manufacturing process and no source area of the analytes could be identified, it was believed that these constituents could be naturally-occurring and that their presence in ground-water samples was not related to manufacturing operations at the site. A review of data collected during voluntary investigations (Section 2.1) and a Remedial Investigation (RI) (Section 2.2), identified the probable source of the inorganics of interest detected in ground water as the suspended solids entrained in the ground-water column during purging activities. Potential sources of the CS₂ detected were natural processes, ambient conditions, or laboratory contamination (Section 4.3). The *Inorganics Monitoring Work Plan* (LAW, 1995b) was prepared by Bridgestone/Firestone, Inc. (BFS) and approved by the USEPA to investigate potential sources and concentrations of the inorganics of interest and CS₂ at the site by reviewing literature and background information and obtaining representative ground-water samples. The literature review was designed to identify potential sources (both natural and anthropogenic) of CS₂ and naturally occurring concentrations of the inorganics of interest. The ground-water sample collection activities were designed to provide a more representative indication of concentrations of the inorganics of interest in ground water at the site by limiting artificial entrainment of solids. The representative concentrations of the inorganics of interest and CS₂, as determined in the Inorganics Monitoring Study, would be compared to the ROD-specified clean-up levels.

IMPLEMENTATION AND RESULTS OF THE INORGANICS MONITORING STUDY

Activities associated with the Inorganics Monitoring Study were conducted from February through July, 1995. The following provides a brief discussion of the tasks completed and summary of the results.

Literature Review

A review of pertinent literature was conducted to evaluate regional ground-water flow direction, the impact of purging techniques on ground-water sample quality, regional soil and ground-water quality, and potential sources of CS₂ and the inorganics of interest. This review indicated the following:

- Studies of the occurrence and concentrations of the inorganics of interest in soil at the site (Section 2.3) and in the region (Section 4.2) indicate that antimony, beryllium, chromium, and lead are present in background samples and occur naturally at the site and in the vicinity of Albany, Georgia.
- A review of quality control data obtained during the RI indicate that the presence of CS₂ in ground-water samples obtained during the RI may have been a result of laboratory contamination (Section 4.3.1).

- Carbon disulfide has numerous natural and anthropogenic sources (Section 4.3.2). Potential sources identified at the site include marshlands, saturated soils, decaying plant and animal tissue, burned areas, indigenous vegetation, agricultural activities, and manufacturing activities.
- Regional ground-water flow in the area of the site is towards the southwest (Section 1.6.2).
- USEPA studies indicate that traditional purging techniques used during Rounds I through IV may entrain solids in the ground-water column yielding samples that, upon analysis, may exhibit artificially elevated concentrations of metal analytes (Section 4.1).

Round V and Round VI Activities

Ground-water data were obtained during Round V to determine ground-water flow directions and representative ground-water quality at the site using low-flow purging and quiescent sampling techniques (Section 5). Ground-water samples were collected in Round VI to confirm and augment the results of the Round V sampling event. The Round V and VI data indicate the following:

- Analysis of ground-water samples collected using low-flow purging and quiescent sampling techniques indicates that the inorganics of interest are not present in ground-water samples obtained from the site at concentrations exceeding ROD-specified clean-up levels (Section 5.2.1.1). The data lead to the conclusion that the occurrence of higher concentrations of the inorganics of interest observed during RI activities (Rounds I through VI) is evidently due to the presence of suspended solids in the samples (Section 6.1.2).
- Results of analysis of ground-water samples for CS₂ indicate that CS₂ is not present in concentrations exceeding the ROD-specified clean-up level (Section 5.2.1.2). The data lead to the conclusion that the occurrence of CS₂ in ground-water samples collected from the site is evidently due to laboratory contamination or background conditions (Section 6.2).
- Ground water observed in the Residuum is present as unconnected perched zones (Sections 2.4.1 and 5.2.2.1). Well BMW-2A is hydraulically up-gradient, therefore it is an appropriate background well for the Residuum (Section 6.3).
- The direction of ground-water flow in the Upper Ocala is towards the southwest in the northern portion of the site (Sections 2.4.2 and 5.2.2.2), therefore well RW-10A is confirmed as an appropriate background well for the Upper Ocala (Section 6.3).
- The direction of ground-water flow in the Lower Ocala is towards the southwest (Sections 2.4.3 and 5.2.2.3), therefore well DRW-11 is confirmed as an appropriate background well for the Lower Ocala (Section 6.3).

In July 1995, BFS presented the results of the data acquisition activities in a meeting with USEPA. In a letter from USEPA and received by BFS on September 7, 1995, USEPA notified BFS that additional monitoring wells

would not be required to determine background concentrations for inorganics at the site and requested that the TMR be prepared and submitted by October 20, 1995. In April 1996, USEPA provided conditional approval of the TMR pending minor revisions, which are incorporated herein.

CONCLUSIONS

Based on the results of the literature and background information review and the data obtained during Rounds V and VI, the following conclusions have been reached:

Inorganics of Interest

The inorganics of interest are not present in ground-water samples obtained from on-site monitoring wells at concentrations exceeding ROD-specified clean-up levels. The data lead to the conclusion that the inorganics of interest observed during the RI are evidently the result of solids entrained in the ground-water monitoring wells during purging and sampling activities. The following results (discussed in detail earlier) support these conclusions:

- The literature review indicates that antimony, beryllium, chromium, and lead are intrinsic to native soils at the site and in the vicinity of Albany, Georgia.
- The data lead to the conclusion that purging and sampling techniques employed during earlier investigations and the RI entrained soil solids in ground-water monitoring wells, and subsequently in ground-water samples.
- Purging and sampling techniques used during implementation of the Inorganics Monitoring Study have been demonstrated to produce results that are more representative of ground-water quality by limiting the amount of solids entrained in ground-water monitoring wells, and subsequently in ground-water samples.
- Results of the analysis of filtered and unfiltered samples obtained during implementation of the Inorganics Monitoring Study indicate that the inorganics of interest are not present at concentrations exceeding ROD-specified clean-up levels in on-site ground-water monitoring wells.

Carbon Disulfide

CS₂ is not present in ground water in concentrations exceeding the ROD-specified clean-up level. The data lead to the conclusion that previous detections of CS₂ were due to natural or background conditions at the site or laboratory contamination. The following results (discussed in detail earlier) support these conclusions:

- Based on a review of RI analytical data and pertinent literature, the presence of CS₂ in ground-water samples obtained during the RI may have resulted from laboratory contamination.
- Natural and anthropogenic sources of CS₂ identified at the site include marshlands, saturated soils, decaying plant and animal tissue, burned areas, indigenous vegetation, agricultural activities, and manufacturing activities.

- Results of analysis of ground-water samples for CS₂ indicate that CS₂ is not present in on-site monitoring wells at concentrations exceeding the ROD-specified clean-up level.

RECOMMENDATIONS

Based on the results and conclusions of the Inorganics Study summarized above, no further action is recommended to address the inorganics of interest and CS₂ at the former Firestone Tire and Rubber Company Albany, Georgia Site.

1.0 INTRODUCTION

This Technical Memorandum Report for the Inorganics Monitoring Study (TMR) is submitted by Bridgestone/Firestone, Inc. (BFS) for the Firestone Tire & Rubber Company Site in Albany, Georgia, pursuant to the Third Modification to Administrative Order by Consent for Remedial Investigation/Feasibility Study (RI/FS), United States Environmental Protection Agency (USEPA) Docket No: 90-48-C, effective February 9, 1994 (Modified AOC). Submittal of the TMR completes the sixth and final task of the *Inorganics Monitoring Work Plan* (LAW, 1995b), dated October 5, 1994, with revision on January 26, 1995, and approved by the USEPA on February 7, 1995. The purpose of the Inorganics Monitoring Study was to evaluate the occurrence of four inorganics of interest (antimony, beryllium, cadmium, and lead) and carbon disulfide (CS₂) observed in ground-water samples collected during the Remedial Investigation (RI). The purpose of this TMR is to present the results of the investigative activities proposed in the *Inorganics Monitoring Work Plan*.

Section 1 of the TMR presents a site description, site history, regional physiography, geology, and hydrogeology. Section 2 discusses the result of previous investigations. Section 3 describes the purpose and the technical approach of the Inorganics Monitoring Study. Sections 4 and 5 describe activities related to implementation of the *Inorganics Monitoring Work Plan*, specifically, review of pertinent literature and performance of field activities (Round V and Round VI). Section 6 discusses an evaluation of the data. Section 7 presents conclusions derived from the studies and recommendations for the site.

1.1 SITE LOCATION

The Firestone Tire & Rubber Company Site is located in Dougherty County at 3300 Sylvester Road, approximately four miles east of Albany, Georgia. The site is located approximately at longitude 84° 3' 22" West and latitude 31° 34' 6" North. Figure 1.1 shows the location of the site.

1.2 SITE DESCRIPTION

The former Firestone Tire & Rubber Company facility encompasses 329.2 acres, including a 1,840,000 square foot building (Figure 1.2). Access to the area is provided by state highways, railways, and the Albany/Dougherty County Airport. The facility is owned by the Albany-Dougherty

Payroll Development Authority and was leased to BFS from 1968 to 1990. The specific and sole use of the facility by BFS was the manufacture of pneumatic tires, which was carried out from 1968 to 1986.

Properties surrounding the facility are listed below:

- Sylvester Road (Route 82) and residential and commercial buildings to the north
- Mixed commercial, residential and agricultural properties to the east
- Seaboard Coastline railroad tracks and U.S. Marine Corps Logistics Support Base to the south
- Mixed commercial, industrial, and agricultural properties to the west

The facility has been leased and operated by Cooper Tire & Rubber Company since March 1990 for the manufacture of pneumatic tires and is zoned industrial/commercial. The zoning information for a 2-mile radius around the site, according to the Dougherty County Planning Commission, is presented as follows:

- North: Residential/Commercial
- East: Industrial/Residential/Agricultural
- South: Commercial/Industrial (Restricted use by Marine Corps Logistics Base)
- West: Residential/Commercial/Industrial

1.3 SITE HISTORY

As discussed above, Firestone Tire & Rubber Company operated the facility from 1968 to 1986. In 1985, prior to ceasing operations, Firestone conducted an assessment of potential environmental issues at the facility. Following the initial assessment activities, Firestone conducted several interim remedial activities, including the removal of underground storage tanks from the Courtyard in 1986, monitoring of ground water, removal of soils impacted by polychlorinated biphenyls (PCBs), and installation and operation of an interim ground-water collection and treatment system.

In June 1988, following a Site Inspection, the USEPA proposed inclusion of the site on the National Priorities List (NPL) pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). BFS entered into an Administrative Order by Consent (AOC) with USEPA in 1990, pursuant to which the company conducted a Remedial Investigation/Feasibility Study (RI/FS).

Information regarding previous environmental investigations at the site was first presented to USEPA in October 1990, as a preliminary investigation report under the AOC.

During the course of the RI, samples of surface soil, subsurface soil, sediment, surface water and ground water were collected under USEPA oversight and analyzed for the Target Analyte List (TAL) and Target Compound List (TCL) in accordance with Contract Laboratory Program (CLP) Statements of Work (SOW). The results of the RI indicated that organic compounds were present in ground water obtained from the Residuum and Transition Zone in one area of the site known as the Courtyard. PCBs were detected in localized soils in the Courtyard where a transformer was formerly located. The RI also indicated that CS₂ and four inorganic analytes (antimony, beryllium, chromium, and lead) were detected in ground-water samples obtained from the site in concentrations exceeding Maximum Contaminant Levels (MCLs), Action Levels or health-based clean-up levels as described in the ROD. The ROD-specified clean-up levels for the inorganics of interest are based on the Safe Drinking Water Act Maximum Contaminant Levels (MCLs) or Action Levels. The ROD-specified clean-up level for CS₂ was calculated from the risk-based Hazard Index of 1.0 using standard residential exposure assumptions. Because none of the inorganics of interest nor CS₂ was used in the manufacturing process and no source area of the analytes could be identified, it was believed that the presence of these constituents could be attributed to background conditions.

In July 1992 and November 1992, respectively, USEPA approved the RI report (WCC, 1992c) and an addendum to the RI report (WCC, 1992a). USEPA approved the FS report (WCC, 1992b) in December 1992.

Following a public meeting and opportunity for public comment on the RI and FS reports, the ROD, which is intended to embody USEPA's decision regarding the selected remedial action for the site, was completed and approved by USEPA on June 24, 1993. The ROD stipulated the selected Remedial Action for ground water and soils in the Courtyard area. The ROD also stipulated further study of the occurrence of the four inorganics and CS₂ in ground-water samples collected during the RI. In November 1994, the Remedial Action for PCB-contaminated soils was completed as discussed in the *Soil Remediation Report* (LAW, 1994). The *90%-Pre-Final Ground-Water Remedial Design Report* (Law, 1995c) was submitted to USEPA on August 31, 1995. On April 19, 1996, BFS submitted the 100% Ground-Water Remedial Design Report responding to USEPA's informal comments to the 90% Pre-Final Ground-Water Remedial Design Report.

In 1994, the AOC was modified in order for BFS to study the occurrence of the four inorganics and CS₂ in ground water at and in the vicinity of the site. The Inorganics Monitoring Study was conducted in 1995. In July 1995, BFS presented the results of the data acquisition activities in a meeting with USEPA. In a letter from USEPA and received by BFS on September 7, 1995, USEPA notified BFS that additional monitoring wells would not be required to determine background concentrations for inorganics at the site and requested that the TMR be prepared and submitted by October 20, 1995.

1.4 REGIONAL PHYSIOGRAPHY

The Firestone site is located in the Dougherty Plain district of the Coastal Plain physiographic province. The Dougherty Plain is an inner lowland that was formed mainly by the erosional stripping of sediments (WCC, 1992c). The land displays level or gently undulating topography, with elevations ranging from 160 feet above mean sea level (msl) in the south (west of the Flint River) to 330 feet above msl in the southeast (east of the Flint River). Measurements at the site indicate ground surface elevations ranging from approximately 200 to 220 feet above msl. A United States Geological Survey (USGS) topographic map of the site is provided in Figure 1.1.

The Dougherty Plain is characterized by karst topography and contains numerous shallow flat-bottomed or rounded sinkholes caused by solutioning and collapse of the underlying limestone. The sinkholes range in depth from only a few feet to more than 25 feet and can have diameters ranging up to several hundred acres.

Many of the sinkholes are filled with material of relatively low permeability and are known to retain water year round. At the site, the storm water detention pond is a natural pond, delineated as Wetland Area No. 3, and is likely to be the surface expression of a sinkhole. Four additional wetland areas were identified at the site. The five wetland areas were delineated by Marbury Engineering Company in January 1990 based on field observations of hydric soils, hydrophytic vegetation, and wetland hydrology. Locations of the wetland areas are illustrated on Figure 1.2.

1.5 GEOLOGY

The site is underlain by Coastal Plain sedimentary strata of pre-Cretaceous to Quaternary age. In general, the strata consist of alternating units of sand, clay, sandstone, dolomite, and limestone that dip gently and

thicken in a southeastern direction (WCC, 1992c). The site-specific geologic units of interest consist of the Residuum, the Upper Ocala Limestone, and the Lower Ocala Limestone.

The lithology of the Residuum varies across the site but can generally be described as sandy clay to clayey sand. The depth to the base of the Residuum unit ranges from approximately 25 to 86 feet where it grades into the underlying Ocala Limestone. A distinct contact is not present between the two formations. Varying quantities of clay and weathered limestone fragments with traces of dolomitic rocks have been identified near the base of the Residuum. The contact between the Residuum and the Upper Ocala, often described as the Transition Zone, is usually very weathered.

The Ocala Limestone is typically white to tan and grades from a highly weathered, fine to coarse grained, fossiliferous, soft limestone into a less weathered, finer grained, less fossiliferous, more indurated limestone at depths ranging from approximately 130 to 150 feet below ground surface. The soft, more weathered limestone is referred to as the Upper Ocala and the more indurated limestone is referred to as the Lower Ocala. The location map for a northeast-southwest cross-section is shown on Figure 1.3, and the cross-section detailing the lithologies at the site is presented in Figure 1.4.

1.6 REGIONAL HYDROGEOLOGY

1.6.1 Hydrostratigraphic Units in the Albany Area

As described by Hicks (Hicks, 1981), the Albany area is underlain by residual soil (Residuum) of varying thicknesses with discontinuous layers of perched ground water, underlain by four principal aquifers. In descending order, the principal aquifers are: the Floridan (also known as the Ocala), Tallahatta (also known as the Claiborne), Clayton, and Providence Sand (considered to be part of the Cretaceous Aquifer System). Based on the USEPA-approved RI report, only the Floridan and the overlying Residuum were further investigated under the third modification to the AOC. The depths and thicknesses of the aquifers vary across the region from site-specific conditions as indicated in Figure 1.5. A discussion of the site-specific aquifer system is presented in Section 2.4 (Site-Specific Geology).

Floridan Aquifer

The Floridan Aquifer (also known as the Ocala Aquifer) consists of the Ocala Limestone (Upper and Lower) throughout Dougherty County and is the primary source of water for irrigation, industrial and rural

domestic use. The Floridan Aquifer stores and transmits large quantities of water mostly in a zone of high permeability in the Lower Ocala. The aquifer is confined below by lower permeability zones in the Lisbon Formation and is semi-confined above by the leaky Residuum and by lower permeability zones in the Upper Ocala. The Upper Ocala exhibits low transmissivity and acts as a semi-confining zone that separates the Residuum and the lower Ocala Limestone. Regionally, the Floridan is 150 to 200 feet thick and is covered by a layer of unconsolidated Residuum which ranges in thickness from 0 feet to 70 feet.

The Floridan Aquifer is typically recharged during the winter and spring months when precipitation is high and evapotranspiration is low. Conversely, little recharge is added to the ground-water system during the dry summer months, during which heavy agricultural pumping causes regional drawdowns in the ground-water level elevations. The rate of mean annual recharge to the Floridan Aquifer ranges from 6 to 16 inches per year (in/yr), with considerable variation in recharge rates both regionally and locally.

The regional ground-water flow pattern for the Floridan Aquifer indicates a west to southwesterly flow (toward the Flint River) in the vicinity of the site. Regional discharge is to the Flint River, but may be locally influenced by pumping centers. Discharge to the underlying Tallahatta Aquifer is restricted by the Lisbon Formation confining unit.

Tallahatta Aquifer

The Tallahatta Aquifer (also known as the Claiborne Aquifer) is the next major aquifer located beneath the Floridan Aquifer. It is separated from the underlying Clayton Aquifer by the clayey Tuscaloosa Sand and is confined above by the Lisbon Formation. Regionally, wells completed in the Tallahatta range in depth from 250 to 400 feet below ground surface (bgs) (USGS, 1981). Ground water from the Tallahatta is under artesian pressure and its potentiometric surface in the region has been measured at 90 feet bgs.

Clayton Aquifer

The Clayton Aquifer lies beneath the Tallahatta Aquifer. Ground water is obtained from the Clayton at depths of about 550 to 840 feet bgs in the Albany area. The Clayton Aquifer is also artesian in the Albany area, with a potentiometric surface measured at approximately 150 feet bgs.

Providence Sand Aquifer

The Providence Sand Aquifer (considered to be part of the Cretaceous Aquifer System) is separated from the Clayton Aquifer by the silty upper Providence Sand-lower Clayton confining sequence. It is the

deepest of the four major aquifers and is generally tapped for municipal use. Regionally, ground water is obtained from the Providence Sand Aquifer at depths ranging from 640 to 960 feet bgs. The aquifer is artesian in the Albany area, with a potentiometric surface measured at approximately 110 feet bgs.

1.6.2 Ground-Water Flow Direction in the Albany Area

Numerous ground-water investigations have been conducted in the Albany area by the USGS within the past two decades. A geohydrologic study of the ground water in the Albany area (Hicks, 1981) presents ground-water elevation data from the Floridan (otherwise referred to as the Ocala) aquifer measured in November 1979. Regional ground-water flow in the vicinity of the site based on USGS measurements is towards the southwest (Figure 1.6). The report states that "the [Ocala] aquifer receives recharge throughout much of the report area and discharges through springs and into streams...." The major influence of ground-water flow in the vicinity of the site appears to be the Flint River which is located approximately 4 miles to the west.

A report of the hydrogeology and availability of ground water in the Floridan Aquifer in the Albany area (Hicks, 1987) presents a similar potentiometric surface using ground-water elevation data measured in November 1985. Regional ground-water flow in the vicinity of the site based on USGS measurements is towards the west-southwest.

2.0 RESULTS OF PREVIOUS INVESTIGATIONS

Prior to implementation of the Inorganics Monitoring Study, numerous ground-water investigations were conducted regionally and at the Firestone Tire & Rubber Company Site. The following subsections discuss the results of site-specific investigations.

2.1 PREVIOUS GROUND-WATER INVESTIGATIONS FOR INORGANICS

Ground-water quality has been monitored at the site since early 1986. A total of 52 ground-water wells were installed as part of site assessments prior to and during the RI (WCC, 1992c). The wells were screened in the three water bearing units of interest (Residuum, Upper Ocala, and Lower Ocala) and ground-water samples were obtained from the wells for chemical analysis. The following sections detail the investigations, the method of sampling, the analytical procedures and results for the inorganics of interest. Table 2.1 provides a listing of all of the existing and abandoned wells at the site at the time this TMR was prepared. Figure 2.1 presents the locations of the monitoring wells. A discussion of ground-water sampling and analysis for CS₂ is provided in Section 2.2.

2.1.1 Historic Ground-Water Assessment

In 1985, BFS, as a part of its facility closure, voluntarily initiated a study of possible releases at the site. A total of 35 ground-water wells were installed at the site prior to the RI as part of assessment activities by Firestone and Cooper. Twenty-seven of the wells were screened in the Residuum or the weathered horizon of the Ocala Limestone Formation (referred to as the "Transition Zone"). Four wells were constructed in the more competent rock of the Upper Ocala Limestone. Two production wells and two observation wells were originally installed to provide water for the former Firestone facility's production needs and were screened in the productive zone of the Floridan Aquifer (total depth of 265 to 284 feet bgs). Prior to the RI, unfiltered ground-water samples from the 35 wells were collected on a routine basis. Of the four inorganics of interest, only chromium and lead were routinely analyzed in these ground-water samples.

The results of the analyses of those samples collected prior to the RI indicated that chromium was not detected and lead was detected in the unfiltered ground-water samples at concentrations below the ROD-specified clean-up level of 15 ug/L with the exception of one sample. Lead was detected on one

occasion above the ROD-specified clean-up level at a concentration of 61 ug/L in a sample collected from observation well OW-2, which is screened in the Lower Ocala. In all other historic analyses of ground water collected from this well, lead was not detected.

2.1.2 Remedial Investigation Ground-Water Assessment

An additional 17 ground-water monitoring wells were installed in the four water bearing units of interest in September 1991 during RI field activities. A description of well installation details and other pertinent technical data are provided in the RI report (WCC, 1992c). Ground water was collected for analysis from selected wells in four rounds of sampling. The following sections describe the sampling and analytical procedures used and present the results of each round with respect to the inorganics of interest.

Round I and Round II

Ground-water samples were collected during RI field activities from the monitoring wells located throughout the site, between August 14 and October 13 (Round I), and December 9 through 12 (Round II), 1991 in accordance with the *Field Sampling and Analysis Plan for Investigations of Firestone Tire & Rubber Company* (RI SAP) (WCC, 1991a) and the *Quality Assurance Project Plan* (WCC, 1991b). Monitoring wells were purged with a Teflon® bailer or a stainless steel submersible pump until three times the well volume of ground water was purged or until the ground water had stabilized, as determined by stable readings of temperature, pH and specific conductance. If the well was emptied during the purging, sufficient time was allowed for the well to recharge before the sample was collected.

After purging, the samples were collected using a decontaminated Teflon® bailer, with the exception of those wells fitted with permanent pumps. Filtered samples were not collected in the first round of sampling. Ground-water samples collected during Round I were analyzed in accordance with the CLP SOW for TCL/TAL parameters by IT Analytical Services (WCC, 1992c).

During the Round II field activities, nine wells were sampled to obtain filtered and unfiltered ground-water samples to assess the impact of suspended solids on the metals concentrations in the ground water. Since the organic analyses were not impacted by suspended solids, additional sampling and analyses for organic compounds was not conducted. Ground water was obtained from monitoring wells screened in the Residuum and Ocala Limestone (Upper and Lower), and filtered and non-filtered samples were analyzed

for metals in accordance with CLP protocols. Results of the analysis of ground water for the inorganics of interest during Rounds I and II are discussed in Section 2.1.3.

Round III

A third round of ground-water samples was collected and analyzed in June 1992. These samples were collected to provide a more comprehensive data set of filtered and unfiltered metals in ground water. The location and number of samples collected were chosen with USEPA oversight and approval. A total of 44 (22 filtered and 22 unfiltered) ground-water samples were collected from 21 monitoring wells and one production well located at the site (WCC, 1992a). The monitoring wells were purged with a Teflon® bailer (or a peristaltic pump in one well) until three times the well volume of water was purged or until the ground water quality had stabilized, as determined by readings of temperature, pH and specific conductance. If the well was emptied during purging, sufficient time was allowed to recharge before the sample was collected. The production well (PW-1), which pumps approximately 1,000 gallons per minute, was allowed to run for approximately 15 minutes prior to collecting a sample. The wells were allowed to recover prior to sample collection in order to allow suspended solids to settle. Samples were collected in a manner specifically to limit entrainment of solids by gently lowering a decontaminated Teflon® bailer to intersect the top of the water column, thereby avoiding disturbance of solids which may have settled to the bottom of the well casing. Well BMW-2 was sampled using 0.25-inch Teflon® tubing connected to a peristaltic pump. Ground-water samples were field filtered with a 0.45-micron filter connected to a Masterflex® pump. The ground-water samples were analyzed for selected metals in accordance with the CLP SOW. Results of the analysis of ground water for the inorganics of interest during Round III sampling and analysis are discussed in Section 2.1.3.

Round IV

To further examine the metals concentrations in unfiltered ground-water samples exceeding ROD-specified clean-up levels during the Round III sampling event, a fourth round of sampling was conducted in December 1992 (WCC, 1993). One filtered and one unfiltered sample were collected from the two wells (MW-1-4 and EMG-6) in which the concentrations of one or more of the inorganics of interest exceeded the ROD-specified clean-up levels during the Round III sampling event. The four samples were collected from the two wells in a manner similar to Round III procedures. The samples collected from well MW-1-4 were analyzed for lead; the samples collected from well EMG-6 were analyzed for beryllium (WCC, 1993) in accordance with the CLP SOW. The results of the Round IV sampling are discussed in Section 2.1.3.

2.1.3 Results of Remedial Investigation Ground-Water Assessment

This section will discuss, by hydrostratigraphic unit, the occurrence of the four inorganics of interest in the ground water during the four RI sampling events (WCC, 1992a; WCC, 1992b; WCC, 1992c; WCC, 1993).

Residuum/Transition Zone

One or more of the four inorganics of interest (antimony, beryllium, chromium and lead) were detected in unfiltered ground-water samples obtained from 12 of the 22 Residuum/Transition Zone wells above ROD-specified clean-up levels in the first round of sampling (Table 2.2).

- In Round II, antimony was detected above the ROD-specified clean-up level, but below the Contract Required Detection Limit (CRDL), in filtered and unfiltered samples collected from three Residuum/Transition Zone wells (BMW-2, EMG-7, and MW-1-2). Antimony was not detected in subsequent sampling events.
- Lead was detected at a concentration above the ROD-specified clean-up level in one unfiltered ground-water sample obtained from a Residuum well (MW-1-4) during Round III sampling activities.
- Beryllium was detected at a concentration above the ROD-specified clean-up level in one unfiltered ground-water sample obtained from a Transition Zone well (EMG-6) during Round III sampling activities.
- Chromium was not detected in Residuum/Transition Zone wells at concentrations exceeding the ROD-specified clean-up levels in Round II through Round IV.

With the exception of antimony in two wells (BMW-2 and EMG-7) during one sampling event (Round II), no inorganics of interest were above ROD-specified clean-up levels in filtered samples.

Upper Ocala

One or more of the four inorganics of interest were detected in the unfiltered ground-water samples obtained from two of the 14 Upper Ocala Wells (EMG-6 and RW-10) in concentrations exceeding ROD-specified clean-up levels during Round I sampling (Table 2.3).

- In Round II, antimony was detected above ROD-specified clean-up levels in both filtered and unfiltered samples obtained from well RW-10, however, the concentrations were below the CRDLs and are estimated.
- No metals were detected above the ROD-specified clean-up levels in subsequent sampling events.

Lower Ocala

Chromium and lead were detected in four unfiltered ground-water samples obtained from the ten Lower Ocala wells in concentrations above the ROD-specified clean-up levels during Round I (Table 2.4).

- Antimony was detected above the ROD-specified clean-up level, but below the CRDL, in one filtered sample obtained from well DRW-11 in Round II. Antimony was not detected in the unfiltered sample obtained from DRW-11 during Round II and was not detected in any other sample during this or subsequent rounds of analysis.
- Lead was also detected in unfiltered ground-water samples obtained from one well (DRW-5) above the ROD-specified clean-up level during Round II, however this concentration was estimated due to possible matrix interference. Lead was not detected above the ROD-specified clean-up level in the filtered sample obtained from DRW-5 during Round II and was not detected in any other sample during this or subsequent rounds of analysis.
- None of the inorganics of interest were detected at concentrations exceeding ROD-specified clean-up levels in subsequent sampling rounds.

In summary, the inorganics of interest were detected at concentrations exceeding ROD-specified clean-up levels during Round I in unfiltered samples from several wells from each hydrostratigraphic unit. Subsequent analysis of ground water (both unfiltered and filtered) obtained from wells which had exhibited elevated concentrations of the inorganics of interest in Round I yielded significantly lower concentrations of the inorganics of interest. This suggests that the elevated concentrations of the inorganics of interest detected in the unfiltered samples represent naturally occurring metals associated with suspended solids and is not representative of ambient ground water quality.

2.2 PREVIOUS GROUND-WATER INVESTIGATIONS FOR CARBON DISULFIDE

Ground water was collected from 46 wells for analysis of CS₂ during the Round I sampling event. The samples were collected as described in Section 2.1.2 and analyzed for CS₂ in accordance with the CLP SOW. The techniques employed to collect CS₂ samples during Round I are believed to produce analytical data which are representative of ground-water quality for volatile organic analytes. These results are provided in Tables 2.2 through 2.4 (WCC, 1992c; WCC, 1992b).

Carbon disulfide was reported in Residuum/Transition Zone wells at concentrations ranging from below the Contract Required Quantitation Limit (CRQL) of 10 ug/L to 260 ug/L. Analysis of samples obtained from three of the 23 wells screened in the Residuum/Transition Zone detected CS₂ at concentrations exceeding ROD-specified clean-up levels (MW-7-8 at 77 ug/L, EMG-7 at 130 ug/L, and BMW-4 at 260 ug/L). CS₂ was not detected at concentrations exceeding the ROD-specified clean-up level in samples obtained from wells screened in the Upper or Lower Ocala. Although CS₂ was not used in the manufacturing processes at the facility, its presence in low concentration is ubiquitous in the ground-water samples obtained from wells across the site.

2.3 CHEMICAL CHARACTERIZATION OF SITE-SPECIFIC SOIL AND SEDIMENT

Soil quality investigations, conducted regionally and at the site, have demonstrated that the inorganics of interest are naturally-occurring in regional soils and sediments. The presence of suspended soils or sediments (solids) in ground-water samples could result in nonrepresentative concentrations of these analytes. Chemical data representing background concentrations of the inorganics of interest during regional investigations conducted by USGS are discussed in Section 4.2. Site-specific RI data are discussed below.

Soil and sediment samples obtained from background locations at the site during RI activities were analyzed to identify metals that occur naturally in the area. As part of RI activities for the Firestone Tire & Rubber Company Site, background samples were obtained of native material believed not to have been impacted by manufacturing activities or disposal practices and were analyzed for the inorganics of interest. The results of the analysis indicated that these inorganics were detected in background soils and/or sediments at the following concentrations.

Range of Concentrations of Inorganics of Interest in Background Soil Samples

Inorganic of Interest (Units)	Firestone Tire & Rubber Company Site		
	Surface Soils	Subsurface Soils	Sediments
Antimony (mg/Kg)	ND	ND-3.8	ND-20.7
Beryllium (mg/Kg)	ND-0.45	ND-6.2	ND
Chromium (mg/Kg)	ND-21.5	12.4-24.1	3.4-18.8
Lead (mg/Kg)	ND-26.5	4.9-34	9.2-12.5

ND - Not Detected (Detection Limits are provided in the RI Report)
mg/Kg - milligrams per kilogram

As discussed in Section 4.2, data obtained during investigations conducted by USGS support the RI results.

2.4 SITE-SPECIFIC HYDROGEOLOGY

Data obtained during the RI indicated that the three uppermost hydrostratigraphic units identified at the site included the Residuum, Upper Ocala, and Lower Ocala (WCC, 1992c). Ground-water flow for each unit was described in the RI report and is summarized below.

2.4.1 Residuum

Classification of the materials encountered during drilling of soil borings indicated that the upper portion of the Residuum soils was composed of sandy clays and clayey sands of varying color. Sand and clay lenses were observed throughout the upper portion of the Residuum. In cases where a clay lens was overlain by a sand lens, perched ground water was encountered.

A distinct, continuous white sandy clay unit was encountered in the lower portion of the Residuum underlying the colored sandy clays described previously. The white sandy clay was referred to as the "Transition Zone" in the RI Report and was included on tables as part of the Upper Ocala Limestone. Based on USGS (1987 and 1993), Georgia Geologic Survey (1981) and Georgia EPD interpretations, this white sandy clay unit is defined as the lower stratigraphic unit within the Residuum and is not considered

part of the Upper Ocala Limestone. The white sandy clay contained limestone fragments and was observed to range from 10 to greater than 70 feet in thickness at the site. This white sandy clay is the same as the continuous clay layer described by the USGS (1987 and 1993) that confines the underlying Floridan aquifer.

Ground-water monitoring wells screened in the sandy clays of the upper portion of the Residuum, as well as the lower white sandy clay in the lower portion of the Residuum yield insignificant amounts of water. As evidenced by the low yields in wells screened within the Residuum and the presence of laterally discontinuous perched ground-water zones in the Residuum, horizontal ground-water flow is expected to be very limited in terms of flow distance and velocity.

2.4.2 Upper Ocala

Data from ground-water elevation measurements observed during the RI indicate that ground-water flow in the Upper Ocala is to the southwest in the northern portion of the site, with a ground-water mounding in the southwestern portion of the site due to the presence of the stormwater detention pond, which is a year-round source of recharge. Ground-water elevations ranged from 164 feet msl to 174 feet msl in September 1991 and 160 feet msl to 170 feet msl in December 1991. Potentiometric surface maps presented in the RI report and the addendum are included in Figures 2.2 and 2.3.

2.4.3 Lower Ocala

Data from ground-water elevation measurements observed during the RI indicate that ground-water flow in the Lower Ocala is to the southwest. Ground-water elevations ranged from 160 feet msl to 164 feet msl in September 1991 and 157 feet msl to 159 feet msl in December 1991. Potentiometric surface maps presented in the RI report and the addendum are included in Figures 2.4 and 2.5.

3.0 PURPOSE AND TECHNICAL APPROACH OF THE INORGANICS MONITORING STUDY

The purpose of the Inorganics Monitoring Study was to develop the technical information and data necessary to determine whether the inorganics and CS₂ detected in ground-water samples obtained at the site during RI activities could be attributed to background conditions. For purposes of this study, background is defined as constituent concentrations representative of naturally-occurring conditions or from other off-site sources not attributable to activities at the site.

Review of the filtered and unfiltered metals data collected in Rounds I through IV indicated that concentrations of the inorganics of interest were lower with each successive sampling round. Based on this observation, sample collection methods used during each sampling event were reviewed to evaluate whether sample collection techniques could have impacted sampling results. Samples were collected during the RI in accordance with USEPA standard operating procedures and under USEPA oversight; however, it was deduced that well purging and sample collection activities may have augmented the entrainment of solids (consisting of soil particles introduced during well installation, development and purging). [The CS₂ results would not have been impacted, since CS₂ is not associated with entrained solids]. Metals intrinsic to soil (and the resultant suspended solids) can be leached during preservation and analytical digestion procedures, resulting in metals concentrations that are not representative of ground-water quality and are biased high due to artificially introduced metals (Section 4.1 and 4.2). During Rounds I and II, samples were collected using the traditional purging techniques of actively surging wells during purging, allowing bailers to sink to the bottom of the well during sample collection, and collecting metals samples after three to four liters of ground-water had already been removed from the well for organics analyses. Each of these three activities is likely to cause solids to become suspended in the water column.

The Inorganics Monitoring Study was designed to provide a logical, step-by-step approach to the data collection, analysis, and evaluation. The methodical approach set forth in the *Inorganics Monitoring Work Plan* incorporated a sequential or iterative approach described by a series of tasks. In performing these tasks, the understanding of site and background conditions was refined. The tasks undertaken as described in the *Inorganics Monitoring Work Plan* are presented below.

- Task 1: Round V Field Activities
- Task 2: Literature Review

- Task 3: Preparation of *Detailed Sampling and Analysis Plan*
- Task 4: Implementation of *Detailed Sampling and Analysis Plan* (Round VI Field Activities)
- Task 5: Data Evaluation
- Task 6: Preparation of TMR

The *Inorganics Monitoring Work Plan* was implemented as follows:

- The initial activities (Tasks 1 and 2) were conducted to evaluate the hypothesis that the source of the inorganics of interest in ground-water samples obtained during the RI were the result of suspended solids and that the source of CS₂ in ground-water samples observed during RI activities was the result of natural processes, ambient conditions, or laboratory contamination. The scope and results of the literature review (Task 2) are presented in Section 4. The scope and results of the Round V field activities (Task 1) are presented in Section 5.
- The results of Tasks 1 and 2 of the *Inorganics Monitoring Work Plan* (Round V field activities and the literature review) supported the hypotheses that the source of the inorganics of interest observed during RI activities was the result of suspended solids in the ground-water samples and that the source of CS₂ observed during RI activities was the result of naturally occurring processes, ambient conditions or laboratory contamination. As such, the *Detailed Sampling and Analysis Plan* (LAW, 1995a) (Task 3) was formulated to provide procedures to confirm these observations. The *Detailed Sampling and Analysis Plan* outlined sampling procedures to be conducted during the Round VI sampling event. The scope and results of the Round VI sampling event (Task 4) are provided in Section 5.
- The results of the data evaluation (Task 5) is included in Section 6.

4.0 SCOPE AND RESULTS OF LITERATURE REVIEW

Pertinent literature was reviewed to evaluate 1) the impact of purging techniques on ground-water sample quality, regional soil and ground-water quality, and 2) the potential sources of the CS₂ and the inorganics of interest. Reference databases were queried to provide information on the occurrence of CS₂ and the inorganics of interest regionally and in locales similar to the Albany, Georgia area. Quality control (QC) data obtained during RI activities were reviewed to evaluate the impact of sampling and analytical activities on the analytical results. The results of the background and data review are summarized below.

4.1 GROUND-WATER PURGING AND SAMPLING TECHNIQUES

A literature review was conducted to evaluate the impact of commonly used purging and sampling techniques on ground-water monitoring results. Studies conducted by USEPA and others indicate that purging techniques have a significant impact on the amount of suspended solids entrained in the water column prior to and during sample collection. The presence of suspended solids in ground-water samples resulting from traditional purging activities (i.e.; by bailing or high flow rate pumping) may yield elevated and unrepresentative concentrations of metallic analytes that are naturally intrinsic to the suspended solids. Historically, filtered and unfiltered samples have been collected during ground-water investigations to quantify the impact of suspended solids on ground-water sample results. Studies conducted by Dr. Robert Puls of the USEPA Robert A. Kerr Research Laboratory indicate that a common result of traditional purging practices is entrainment of particles in the well column (Puls et al, 1992) resulting in the need to filter samples to remove the entrained solids (Puls and Powell, 1992; Backhus et al, 1993).

Samples collected during Rounds I through IV were collected using the traditional method, although during Rounds III and IV, surging of wells was specifically reduced in an effort to lower turbidity in the well column. The traditional purging technique is defined as removal of ground-water at a high pumping rate or bailing until a specified multiple of well volumes is removed. Purging using this technique results in suspension of solids in the water column. The ground-water sample containing the suspended solids is then placed in 1-liter containers and preserved with nitric acid to lower the pH to a maximum of 2.0. This low pH environment dissolves the naturally occurring metals intrinsic to the

suspended solids. Subsequent acid digestion during sample preparation further releases these naturally occurring metals, resulting in elevated metals concentrations.

In a 1993 Ground-water Sampling Workshop (USEPA, 1993), USEPA specifically sought to discuss the impact of metals intrinsic to the suspended solids on the quality of ground-water sample results, the applicability of filtered ground-water data, and the use of alternative purging techniques during ground-water monitoring. The recommendations issued from the workshop include purging monitoring wells using low-flow pumping techniques in order to collect more representative samples, which makes the unfiltered and filtered sample results more comparable. The low-flow pumping purge technique dictates "minimal" drawdown of the ground-water surface with stabilization of turbidity being the ideal endpoint of purging. These purging and sampling techniques, which are currently recognized by USEPA to yield the most representative data, were used during Rounds V and VI for the collection of filtered and unfiltered ground-water samples (Sections 5.1.3 and 5.1.4).

In an effort to evaluate whether solids entrained in the ground water during purging and sampling activities impacted the ground-water monitoring results at the Albany site, filtered samples were collected as a part of monitoring activities in Rounds II through IV. Based on the use of traditional purging methods, unfiltered samples collected during Rounds I through IV, and particularly Rounds I and II, would be likely to exhibit artificially elevated concentrations of metallic analytes. Evaluation of the unfiltered metals results from Rounds II through IV indicate that improvements in purging and sampling techniques during sampling Rounds III and IV partially alleviated the impact of suspended solids on the detected concentrations of the inorganics of interest. Further refinement of the purging and sampling techniques was then developed and implemented to acquire ground-water samples that were more representative of actual ground-water conditions.

4.2 BACKGROUND CONCENTRATIONS OF INORGANICS OF INTEREST

A literature review was conducted to evaluate the natural occurrence and background concentrations of the inorganics of interest in the vicinity of the site. As discussed in Section 2.3, the inorganics of interest have been detected in background soils and sediments collected from the Firestone site during RI activities (WCC, 1992c). Two additional studies of background soils in the Albany area have been conducted by USGS. In 1989, USGS conducted a preliminary investigation (Chapman, 1990) at an abandoned manufactured gas plant (MGP) located approximately four miles west of the Firestone site. As part of this

study background soils were obtained for chemical characterization. A previous study conducted by USGS (Shacklette, 1981 and 1984) was designed to estimate the range of naturally occurring elements in surficial materials throughout the conterminous United States. As part of this study, soil samples were collected throughout the United States at locations which were deemed to be unaltered by agricultural or industrial practices. One such soil sample was collected in Dougherty County, approximately 12 miles west-southwest of Albany, and can be used to represent background concentrations for soils in the area. Table 4.1 provides ranges of concentrations of the inorganics of interest detected for the three investigations.

Antimony

Antimony was detected in background soils and sediments at the site in concentrations ranging from below the detection limit of 1.7 to 20.7 mg/Kg (Section 2.4). Antimony was also detected during the USGS investigation at the MGP facility at concentrations ranging from 0.3 to 0.4 mg/Kg (Chapman, 1990). The soil sample collected southwest of Albany during the nationwide USGS study was not analyzed for antimony. The nearest soil sample analyzed for antimony, collected near Quincy, Florida, exhibited a concentration of antimony (1 mg/Kg), which was above the geometric mean of samples collected throughout the conterminous United States (Figure 4.1) (Shacklette, 1981 and 1980). Quincy, Florida is located approximately 60 miles south of Albany, Georgia and is in the same physiographic province. The results of the three investigations are consistent and indicate that antimony is present and naturally occurring in regional and site-specific soils.

Beryllium

Beryllium was detected in background soils at the site in concentrations ranging from below the detection limit of 0.22 to 6.2 mg/Kg (Section 2.4). Beryllium was not included in the analyte list during the USGS investigation at the MGP facility (Chapman, 1990). The soil sample collected southwest of Albany during the nationwide USGS study exhibited a beryllium concentration (1.5 mg/Kg) above the national geometric mean of samples obtained throughout the conterminous United States (Figure 4.2) (Shacklette, 1981 and 1984). The results of the two investigations are consistent and indicate that beryllium is present and naturally occurring in regional and site-specific soils.

Chromium

Chromium was detected in background soils and sediments at the site in concentrations ranging from below the detection limit of 0.83 to 24.1 mg/Kg (Section 2.4). Chromium was also detected during the USGS investigation at the MGP facility at concentrations ranging from 55 mg/Kg to 70 mg/Kg (Chapman, 1990). The soil sample collected southwest of Albany during the nationwide USGS study exhibited a chromium concentration (100 mg/Kg) above the national geometric mean of samples obtained throughout the conterminous United States (Figure 4.3) (Shacklette, 1981 and 1984). The results of the three investigations are consistent and indicate that chromium is present and naturally occurring in regional and site-specific soils.

Lead

Lead was detected in background soils and sediments at the site in concentrations ranging from below the detection limit of 6.0 to 34 mg/Kg (Section 2.4). Lead was also detected during the USGS investigation at the MGP facility at concentrations ranging from 19 mg/Kg to 22 mg/Kg (Chapman, 1990). The soil sample collected southwest of Albany during the nationwide USGS study exhibited a lead concentration (20 mg/Kg) above the national geometric mean of samples obtained throughout the conterminous United States (Figure 4.4) (Shacklette, 1981 and 1984). The results of the three investigations are consistent and indicate that lead is present and naturally occurring in regional and site-specific soils.

In summary, these investigations involving analysis of background soil samples indicates that the inorganics of interest are present and occur naturally in regional and site specific soils. As discussed in Sections 2.3 and 3.0, the data lead to the conclusion that preservation or digestion of unfiltered ground-water samples containing artificially-entrained suspended solids accounts for the elevated concentrations of the inorganics of interest observed during RI activities.

4.3 POTENTIAL SOURCES OF CARBON DISULFIDE

The occurrence of CS₂ in ground-water samples collected during the RI was evaluated by reviewing QC data collected during the RI and conducting a literature review of the potential sources of CS₂ in the vicinity of the site or in areas similar to the site. CS₂ is a highly volatile compound that does not readily adsorb to soils. Thus, it is unlikely that a CS₂ spill would linger in the environment.

4.3.1 Quality Control Data Review

Data obtained from QC samples were reviewed to evaluate the potential for field and laboratory contamination of samples. The quality control samples reviewed included organic-free water, rinsate blanks, field blanks, and trip blanks. Of the 53 QC samples reported, 16 exhibited detectable concentrations of CS_2 (frequency of 30%). The three samples of organic free water did not exhibit detectable concentrations of CS_2 . Eight of the 30 trip blanks (27%) exhibited concentrations of CS_2 ranging from 1 to 9 mg/L. Eight of the nineteen field blanks (42%) exhibited concentrations of CS_2 ranging from 1 to 9 mg/L.

The presence of CS_2 in the field and trip blanks indicates that the integrity of environmental samples collected during the RI may have been impacted due to ambient conditions during sample collection and analysis.

4.3.2 Natural and Anthropogenic Sources of Carbon Disulfide

CS_2 has numerous natural or anthropogenic sources that could potentially impact ground-water samples obtained from the site. Because CS_2 is volatile and slightly soluble in water, natural or industrial emissions in the area could impact water and moist soil samples during sample collection. The following discussion provides information on potential sources of CS_2 at the site.

Natural Sources

Potential natural sources of CS_2 at the site include gaseous emission from marshy soils, saturated soils, decaying animal and plant tissue, burned areas, and vegetation. CS_2 has been observed to be a natural product of anaerobic biodegradation in coastal areas, including salt marshes and other areas of high biological productivity (Carroll, 1985; Khalil, *et al*, 1984; Lovelock, 1974). Tidal marsh soil at a field capacity moisture content can emit more CS_2 than at saturation (Farwell, 1979). CS_2 is produced by microbial reduction of sulfates in soil (Khalil, *et al*, 1984) and CS_2 has been shown to be produced from normally aerobic loam in the saturated state (Farwell, 1979). Water-logged soils are typically chemically reducing and sulfur-rich, and, therefore, are conducive to the production of sulfides. The release of CS_2 from soils is dependent on temperature and solar irradiation, and burned areas have been observed to emit higher quantities of sulfur gases than adjacent unburned areas (Hines, 1993). Plants which have been

shown to emit CS₂ include white oak, mimosa, acacia, and marsh grass (Adams, 1979; Westberg, 1984; Haines, 1987).

Anthropogenic Sources

Anthropogenic sources of CS₂ include certain manufacturing operations, waste handling operations, and agricultural application. CS₂ gas has been observed to be released during the manufacture of viscose rayon, carbon tetrachloride, cellophane, and rubber chemicals (Chemical Marketing Reporter, 1986). CS₂ may be formed and released during the degradation of waste materials, such as sewage treatment, municipal landfills or wastewater sludges (Abrams, 1975). Agriculturally, CS₂ is used as a pesticide in stored grains and as a soil fumigator to control fungi and weeds (Chemical Marketing Reporter, 1986).

Based on the literature review of CS₂, several potential sources have been identified at the site. The southern and northwestern portions of the site are characterized by numerous wetlands. Plant species which are known to be a source of CS₂ emissions are present at the site, as discussed in the ecological study included in the RI report. Prior to industrialization of the site, the land was used for farming and CS₂ could have been applied to soils as a fumigant. During both RI and Inorganics Monitoring Study activities, ambient conditions could have been impacted by the manufacture of tires by Cooper Tire & Rubber Company.

5.0 SCOPE AND RESULTS OF GROUND-WATER SAMPLING ACTIVITIES

Ground-water sampling activities were conducted as part of the implementation of the *Inorganics Monitoring Work Plan*. Ground-water samples were collected during two sampling events, which will be referenced as Round V and Round VI. The Round V activities, described in Task 1 of the *Inorganics Monitoring Work Plan*, were conducted at the site from February 20, 1995 through March 15, 1995. The Round VI activities, described in the *Detailed Sampling and Analysis Plan*, were conducted at the site from May 22, 1995 through May 26, 1995. Ground-water sampling activities for Rounds V and VI included collection of ground-water depth measurements, redevelopment and purging of ground-water monitoring wells, collection of ground-water samples from monitoring wells, and analysis of ground-water samples. The following section describes each activity in greater detail.

Field activities conducted prior to the ground-water sampling activities included developing an inventory of current well conditions, abandoning and installing ground-water monitoring wells, surveying the locations of newly installed monitoring wells and staff gauges. The additional field activities are discussed in Appendix A. Boring logs and monitoring well diagrams are included in Appendix B.

5.1 GROUND-WATER SAMPLING AND ANALYSIS

5.1.1 Measurement of Water Elevations

During Round V and VI activities, surface water and ground-water elevations were obtained at the site. The depth to ground water was measured in each well at the site (excluding those fitted with permanent pumps) from a surveyed reference point at the top of the well casing. The ground-water elevation was calculated using the surveyed top of casing elevation. Surface water elevations in the wetland areas were measured at the location of the three staff gauges. The calculated elevations are provided in Table 5.1.

5.1.2 Well Development Activities

The Residuum, Transition Zone, and Upper Ocala wells that were to be sampled during Rounds V and VI were developed prior to purging and sampling by removing approximately five well volumes of

ground water with a bailer as discussed in Appendix A. Lower Ocala wells were not redeveloped prior to purging and sampling because the solids in these wells were not expected to be disturbed during low-flow pumping due to the distance from the pump to the bottom of the well. Wells were allowed to recover a minimum of 24 hours after development before purging activities were initiated.

5.1.3 Well Purging

As described in the *Inorganics Monitoring Work Plan*, various purging and sampling techniques were available for use during this study. After experimentation using several purging methods, the combination of techniques eventually employed for purging and sampling was selected to limit the measured and observed turbidity in ground-water samples.

Round V

With the exception of PW-1, monitoring wells that were sampled during Round V (Figure 5.1) were purged using a submersible pump at low sustained flow in higher yield wells or by cycling the pump (at the lowest possible sustainable flow rate, over relatively long periods of time) in lower yield wells. In most cases, after 1 to 4 hours of purging, the ground-water quality parameters (pH, specific conductance, temperature, and turbidity) had stabilized, and the purged ground water was observed to be clear. After removing approximately 50 gallons of ground-water from wells MW-1-6A and MW-1-5A, the purged ground water remained turbid. Ground-water quality parameters in the wells, however, had stabilized and the purging was deemed complete. As discussed with USEPA on March 2, 1995 and confirmed in the letter from LAW to USEPA, dated March 6, 1995, those wells that after purging did not produce clear ground water were allowed to recover beyond the 90% recovery level prior to sampling for inorganics.

Round VI

All of the wells sampled during Round VI, with the exception of PW-1 and MW-7-5, were purged in the manner discussed above. Based on the small volume of ground water in MW-7-5, and the depth to ground water, a submersible pump could not be used for purging this well without potentially damaging the pump by running it dry. Well MW-7-5 was purged using laboratory-cleaned Teflon® bailers in accordance with USEPA Region IV standard operating procedure.

When purging was considered complete, the pump or bailer was slowly and gently removed from the well. Table 5.2 lists the values of the ground-water quality parameters for the wells at the end of purging.

Well PW-1, which is fitted with a permanent pump, was evacuated during Rounds V and VI for approximately 10 minutes prior to sample collection. Well PW-1 pumps water at an approximate rate of 1000 gallons per minute.

5.1.4 Ground-Water Sample Collection

After the well had been allowed a sufficient time to recover (based on recovery rates noted during purging), the samples were collected during Rounds V and VI using dedicated laboratory-cleaned Teflon® bailers. Appendix A describes the procedures used to collect ground-water samples. Samples obtained for CS₂ analysis were collected as soon as possible after the well had recovered to 90% of static water level. For cases in which a well was purged in the morning, the sample was collected later that afternoon. For cases in which the well was purged in the afternoon, the sample for carbon disulfide (CS₂) analysis was collected on the same day, and the samples for metals analysis were collected the following morning.

Samples obtained from the first bailer for analysis of unfiltered metals were visually clear, including the samples collected from wells MW-1-6A and MW-1-5A in Round V and well MW-7-5 in Round VI. The successive bailers collected (if necessary) often exhibited higher visual levels of turbidity due to agitation of the water column during collection of the unfiltered sample. The increased entrainment of solids observed during Round V and VI sampling confirms that the sampling technique increased the amount of suspended solids in the samples and evidently caused the elevated concentrations of the inorganics of interest in ground-water samples collected during Round I through Round IV. At the request of USEPA, one aliquot of ground water was collected during Round VI and analyzed for turbidity after all analytical samples were collected (Table 5.2).

5.1.5 Analysis of Ground-Water Samples

Ground-water samples were packaged and shipped following chain-of-custody procedures to Quanterra Laboratories in Pittsburgh, Pennsylvania. Ground-water samples were analyzed following CLP SOW OLM1.8 for CS₂ and ILM3.0 for antimony, beryllium, chromium, and lead. The analytical results are summarized in Table 5.3 (Round V) and 5.4 (Round VI) and discussed in Section 5.2.1.

5.2 RESULTS OF THE GROUND-WATER SAMPLING ACTIVITIES

Data obtained as a result of the Round V and Round VI field activities include ground-water quality and ground-water flow direction.

5.2.1 Evaluation of Ground-Water Quality

Results of chemical analysis of the Round V and Round VI ground-water samples for CS₂ and the inorganics of interest indicated that the concentration of the analytes in all samples is below the ROD-specified ROD-specified clean-up levels listed below:

Inorganic of Interest	ROD-Specified Clean- Up Level (ug/L)
Antimony	6
Beryllium	4
Chromium	100
Lead	15
Carbon Disulfide	56

ug/L - microgram per liter

Table 5.3 presents the results of the Round V analysis, including QC samples. Table 5.4 presents the results of the Round VI analysis, including QC samples. The analytical data are included in Appendix C. The following sections discuss the analytical results by analyte and sampling round.

5.2.1.1 Results of Chemical Analysis of the Inorganics

Antimony, beryllium, chromium, and lead were not detected in ground-water samples at concentrations exceeding ROD-specified clean-up levels.

Antimony

Round V - Antimony was detected during Round V at estimated concentrations ranging from 2.0 ug/L to 2.8 ug/L in two filtered (RW-3 and OW-2, respectively) and four unfiltered ground-water samples (wells DRW-11, RW-10A, MW-14, and MW-1-5A).

Round VI - Antimony was not detected in any environmental or quality control samples collected as part of Round VI activities. The reported detection limit for antimony (2.4 ug/L) was below the ROD-specified clean-up level of 6 ug/L.

Beryllium

Round V - Beryllium was detected in estimated concentrations ranging from 0.28 ug/L to 0.43 ug/L in unfiltered samples collected from wells MW-7-5, MW-1-5A, and MW-1-4, and at an estimated concentration of 0.58 ug/L in filtered sample MW-1-4.

Round VI - Beryllium was not detected in concentrations exceeding the ROD-specified clean-up level of 4 ug/L in any samples collected during Round VI sampling activities. Beryllium was detected in estimated concentrations ranging from 0.1 ug/L to 1.9 ug/L in 22 of the 23 unfiltered samples and in concentrations ranging from 0.3 ug/L to 1.7 ug/L in each of the 22 filtered samples. Because beryllium was detected in associated laboratory method blanks and preparation blanks at concentrations ranging from 0.1 ug/L to 1.8 ug/L, it is likely that the detected concentrations in the environmental samples is due to laboratory contamination. The impacted data have been flagged appropriately. These low-level estimated detections did not adversely affect the utility of the data, as all were below the ROD-specified clean-up level.

Chromium

Round V - Chromium was detected in concentrations ranging from 0.96 ug/l (estimated) to 22.6 ug/L in unfiltered ground-water samples collected from 18 wells and at concentrations ranging from 0.76 ug/L (estimated) to 23.9 ug/L in filtered ground-water samples collected from 15 wells. Because chromium was detected in an associated laboratory sample preparation blank at 1.6 ug/l, it is likely that many of the detected concentrations in the environmental samples are due to laboratory contamination. The impacted data have been flagged appropriately. These low-level estimated detections did not adversely affect the utility of the data, as all were below the ROD-specified clean-up level.

Round VI - Chromium was not detected in concentrations exceeding the ROD-specified clean-up level of 100 ug/L in any samples collected during Round VI sampling activities. Chromium was detected in concentrations ranging from 0.8 ug/L (estimated) to 17.8 ug/L in 19 of the 23 unfiltered samples and in concentrations ranging from 0.5 ug/L (estimated) to 11.3 ug/L in 16 of the 22 filtered samples. Because chromium was detected in associated laboratory method blanks and preparation blanks at concentrations ranging from 1.9 ug/L to 2.5 ug/L, it is likely that many of the detected concentrations in the environmental samples are due to laboratory contamination. The impacted data have been flagged appropriately. These low-level estimated detections did not adversely affect the utility of the data, as all were below the ROD-specified clean-up level.

Lead

Round V - Lead was detected in concentrations ranging from 0.94 ug/l (estimated) to 5.9 ug/L in unfiltered ground-water samples and at concentrations ranging from 2 ug/L (estimated) to 5.5 ug/L (estimated) in five filtered ground-water samples. Lead was not detected in the remaining ground-water samples above the sample detection limit. Because lead was detected in an associated laboratory sample preparation blank at 1.7 ug/L, it is likely that many of the detected concentrations in the environmental samples are due to laboratory contamination. The impacted data have been flagged appropriately. These low-level estimated detections did not adversely affect the utility of the data, as all were below the ROD-specified clean-up level.

Round VI - Lead was not detected in concentrations exceeding the ROD-specified clean-up level of 15 ug/L in any samples collected during Round VI sampling activities. Lead was detected in concentrations ranging from 0.8 ug/L (estimated) to 5.5 ug/L in 6 of the 23 unfiltered samples and in concentrations ranging from 0.5 ug/L (estimated) to 11.3 ug/L in 16 of the 22 filtered samples. Lead was not detected in any of the 22 filtered samples. Because lead was detected in associated laboratory method blanks and preparation blanks at concentrations ranging from 0.7 ug/L to 1.7 ug/L, it is likely that many of the detected concentrations in the environmental samples are due to laboratory contamination. The impacted data have been flagged appropriately.

Results of analysis of duplicated samples MW-7-5 and DRW-11 during Round V and samples BMW-2A and EMG-6 during Round VI were within guideline-suggested control limits (USEPA, 1988; USEPA,

1992). These results indicate that sampling and analytical procedures were conducted in a reproducible manner.

Analytical results for inorganics of interest in filtered and unfiltered samples were not significantly different. A comparison was conducted using the method included in the data validation functional guidelines (USEPA, 1988) for duplicate samples. This method states that Relative Percent Difference (RPD) of duplicate samples should fall within a control limit of $\pm 20\%$ for sample values greater than five times the CRDL. If one or both results are less than five times the CRDL, a control limit of \pm the CRDL is used. For this comparison, the ROD-specified clean-up level was substituted for the CRDL in cases where the ROD-specified clean-up level is lower than the CRDL. In no case did the RPD for Round V data fall outside of the control limit. In only two cases (MW-1-3 for chromium and RW-10A for lead) did the RPD for Round VI data fall outside of the control limit. This similarity of data indicates that the unfiltered samples did not contain significant amounts of suspended solids. It also indicates that the filtered data are representative of concentrations of the inorganics of interest in ground water.

5.2.1.2 Results of Chemical Analysis for CS₂

During Rounds V and VI, ground-water samples were collected for CS₂ analysis from six monitoring wells (BMW-2A, BMW-4, EMG-7, MW-7-8, RW-10A and DRW-11). CS₂ was not detected in any sample at concentrations exceeding the ROD-specified clean-up level of 56 ug/L.

Round V - CS₂ was detected above the CRQL of 10 ug/L in only one ground-water sample, collected from well EMG-7, at 36 ug/L. This well is located at the southwestern-most portion of the site, south of the Storm Water Detention Pond. CS₂ was detected in only one additional environmental sample obtained from background well BMW-2A (2 ug/L, estimated). The field blank collected on February 27, 1995 was reported to contain CS₂ at concentrations of 1.3 ug/L (estimated). The presence of low-level concentrations of CS₂ in the field blank and well BMW-2A suggest that the presence of CS₂ may be attributable to ambient conditions during sample collection or possibly introduced during laboratory analysis.

Round VI - CS₂ was detected in two of the six wells at an estimated concentration of 1 ug/L. CS₂ was not detected in the samples from the four remaining wells or the QC samples.

Results of analysis of duplicate sample DRW-11 (Round V) and sample RW-10A (Round VI) were within guideline-suggested control limits (USEPA, 1988; USEPA, 1992). These results indicate that sampling and analytical procedures were conducted in a reproducible manner.

5.2.2 Evaluation of Ground-Water Flow Direction

Depth to ground water was measured in all wells not fitted with permanent pumps on March 28, 1995 (Round V) and May 22, 1995 (Round VI). The ground-water elevations were calculated using surveyed top of casing elevations for the wells. Figure 1.3 provides the location map of a hydrostratigraphic cross-section transversing the site (southwest to northeast). Figure 1.4 provides a hydrostratigraphic cross-section for the site which illustrates the variation of the placement of the screened interval from well to well within the same zone. To eliminate the effects of this variation on measured potentiometric levels and to provide an accurate and representative potentiometric surface, ground-water elevations across the site were evaluated utilizing wells screened in the same hydrostratigraphic units. The results of this evaluation were similar to the findings presented in the RI and will be discussed in the following sections.

5.2.2.1 Residuum

Ground-water elevations in the Residuum supported the earlier interpretation (Section 2.4.1) that the water bearing units in the Residuum are perched due to the presence of discontinuous clay lenses found throughout the Residuum.

Round V - Ground-water elevations ranged from 170.4 feet above mean sea level (msl) to 205.76 feet (msl). [NOTE: Ground-water elevations for wells MW-1-3 and PTW-1 are believed to have been influence by interim remediation system pumping activities.] The highest ground-water elevation (205.76 feet, msl) was observed in the background well BMW-2A. Ground-water elevations observed on March 28, 1995 for Residuum/Transition Zone wells in the courtyard area ranged from 170.4 feet (msl) to 194.3 feet (msl). Ground-water elevations in the undeveloped area in the southern portion of the site ranged from 170.4 feet (msl) to 194.1 feet (msl). Ground-water elevations in wells west of the main building ranged from 170.2 feet (msl) to 172.7 feet (msl).

Round VI - Ground-water elevations measured on May 22, 1995, ranged from 163.9 feet (msl) to 204.5 feet (msl). The highest ground-water elevation (205.76 feet, msl) was observed in the background well BMW-2A. Ground-water elevations for Residuum wells in the courtyard area ranged from 165.7 feet (msl) to 196.9 feet (msl). Ground-water elevations in the undeveloped area in the southern portion of the site ranged from 169.3 feet (msl) to 190.4 feet (msl). Ground-water elevations in wells west of the main building ranged from 163.9 feet (msl) to 166.8 feet (msl).

Based on the wide variation in ground-water elevations and the lack of horizontal interconnection between the perched water-bearing zones, no potentiometric surface map was developed for the Residuum. The ground-water elevations observed during the Round V and Round VI activities confirm the use of BMW-2A as the background well for the Residuum based on the considerably higher ground-water elevation observed in well BMW-2A. Ground-water levels observed in the other portions of the site consistently range approximately 10 feet to 30 feet below the level measured in background well BMW-2A.

5.2.2.2 Upper Ocala

Ground-water elevations in the Upper Ocala supported the earlier interpretation (Section 2.4.2) that ground-water flow in the northern portion of the site is to the southwest.

Round V - Ground-water elevations in the Upper Ocala ranged from 169.4 feet (msl) to 174.3 feet (msl). Because the Upper Ocala wells are not screened in a single hydrostratigraphic unit, a potentiometric surface map of the Upper Ocala was prepared based on the ground-water elevations from wells screened approximately 20 feet within the Ocala Limestone. The resulting potentiometric surface map (Figure 5.2) is similar to the map presented in the RI.

Round VI - Ground-water elevations in the Upper Ocala ranged from 163.4 feet (msl) to 170.5 feet (msl). A potentiometric surface map of the Upper Ocala was prepared as discussed above using wells screen approximately 20 feet within the Ocala Limestone. The Round VI potentiometric surface (Figure 5.3) is similar to the surface observed during previous site-specific and regional investigations. Ground water in the northern portion of the site flows towards the southwest, as observed in potentiometric surface maps prepared from data collected on December 17, 1991 (Figure 2.2); June 19, 1992 (Figure 2.3); March 28, 1995 (Figure 5.2); and May 22,

1995 (Figure 5.4). Recharge from the stormwater detention pond to the Upper Ocala causes a mounding effect on the ground water potentiometric surface. Recharge for the pond is observed by the diversion of ground-water eastward and westward around the pond and by the considerably smaller fluctuation in ground-water elevations between the Round V and Round VI data. This effect is seen in the four potentiometric surfaces presented in this document.

The regional ground-water gradient (hence ground-water flow) in the Ocala is generally toward the southwest in the Albany area and beneath the site, as illustrated by Figure 1.6 (Hicks, 1981). Figure 1.6 illustrates prominent variations in ground-water flow direction in the Albany area due to the effects of recharge from several surface water bodies in the area, including the Flint River, Muckalee Creek, Kinchatoonie Creek and Coolewahee Creek.

The ground-water elevations and general flow direction measured at the site are consistent with the USGS findings in 1979 (i.e., elevations between 170 and 180 feet (msl) and flow generally to the southwest). Recharge from the wetlands area and the stormwater detention pond located on the southern portion of the site create a local mounding of the potentiometric surface. Ground water flows radially off of this mound, causing a minor local deflection of the regional southwestern flow trend, locally diverting flow to the west around the recharge mound.

The ground-water elevations observed during the Round V and Round VI activities confirm the use of RW-10A as the background well for the Upper Ocala based on the regional and local direction of ground-water flow and the observed ground-water elevation and location of well RW-10A.

5.2.2.3 Lower Ocala

Ground-water elevation in the Lower Ocala supported the earlier interpretation that ground-water flow is toward the southwest.

Round V - Ground-water elevations in the Lower Ocala ranged from 167.1 feet (msl) to 169.4 feet (msl). A potentiometric surface map (Figure 5.4) of the Lower Ocala indicates that ground-water flow direction is toward the southwest.

Round VI - Ground-water elevations in the Lower Ocala ranged from 161.4 feet (msl) to 163.3 feet (msl). A potentiometric surface map (Figure 5.5) of the Lower Ocala indicates that ground-water flow direction is toward the south-west.

The much higher hydraulic conductivity of the Lower Ocala compared to that of the Upper Ocala results in a much smoother and flatter potentiometric surface. This is also consistent with USGS findings.

The ground-water elevations observed during the Round V and Round VI activities confirm the use of DRW-11 as the background well for the Lower Ocala based on the regional and local ground-water flow direction and the observed ground-water elevation and location of well DRW-11.

5.3 RESULTS SUMMARY

The results of Round V and Round VI activities indicated the following:

- Data obtained from analysis of ground-water samples collected using low-flow pumping purge techniques and quiescent sampling techniques indicate that the inorganics of interest are not present in ground-water samples obtained from the site at concentrations exceeding ROD-specified clean-up levels (Tables 5.3 and 5.4). These results support the hypothesis and lead to the conclusion that samples collected during RI activities were impacted by suspended solids resulting in elevated concentrations of the inorganics of interest. The results also indicate that filtered ground-water samples are representative of ground-water quality.
- Data obtained from analysis of ground-water samples (Tables 5.3 and 5.4) indicate that CS₂ is not present in ground-water samples at concentrations (1 ug/L to 36 ug/L) exceeding the ROD-specified clean-up level (56 ug/L). The presence of CS₂ in a field blank at a concentration of 1.3 ug/L indicates that the presence of CS₂ in ground-water samples from the site could be attributed to the presence of CS₂ in the ambient atmosphere during sampling or from laboratory contamination.
- Well BMW-2A is hydraulically upgradient of the other Residuum wells at the site and is located in an area (baseball field) where no known manufacturing or disposal practices were conducted. Based on these observations, the use of well BMW-2A as a background well for the Residuum is appropriate, though it is evident that ground water observed in the Residuum is present as unconnected perched zones.

- The direction of ground-water flow in the Upper Ocala is towards the southwest in the northern portion of the site, confirming the appropriate use of well RW-10A as a background well for the Upper Ocala (Figures 5.2 and 5.3).
- The direction of ground-water flow in the Lower Ocala is towards the southwest, confirming the appropriate use of well DRW-11 as a background well for the Lower Ocala (Figures 5.4 and 5.5).

6.0 DATA EVALUATION

The purpose of the Inorganics Monitoring Study was to evaluate the occurrence of and potential sources of the four inorganics of interest and CS₂ observed in ground-water samples obtained during the RI. The Inorganics Monitoring Study was designed to provide data to develop a better understanding of representative concentrations of the inorganics of interest and CS₂ in ground water at the site.

6.1 INORGANICS OF INTEREST

The data resulting from the Inorganics Monitoring Study were evaluated by direct comparison with the ROD-specified clean-up levels. The results from Round I through Round VI for the inorganics of interest are tabulated in Tables 6.1 through 6.3 and summarized in the following sections.

6.1.1 Comparison of Round V and VI Results

6.1.1.1 Residuum/Transition Zone Wells

Antimony

Antimony was not present in ground-water samples collected from Residuum/Transition Zone wells during Round V and Round VI sampling activities in concentrations exceeding the ROD-specified clean-up level of 6 ug/L. Antimony was detected in three unfiltered samples at estimated concentrations ranging from 2.0 ug/L to 2.8 ug/L. Antimony was not detected in the filtered samples.

Beryllium

Beryllium was not present in ground-water samples collected from Residuum/Transition Zone wells during Round V and Round VI sampling activities in concentrations exceeding the ROD-specified clean-up level of 4 ug/L. Beryllium was detected in three unfiltered samples at estimated concentrations ranging from 0.28 ug/L to 0.43 ug/L and in one filtered sample at an estimated concentration of 0.58 ug/L. [NOTE: Samples in which beryllium was detected at concentrations less than five times the associated blank contamination are flagged with a "P" in Table 6.1 and were considered to be not detected.]

Chromium

Chromium was not present in ground-water samples collected from Residuum/Transition Zone wells during Round V and Round VI sampling activities in concentrations exceeding the ROD-specified clean-up level of 100 ug/L. Chromium was detected in seven unfiltered samples at concentrations ranging from 1.0 ug/L (estimated) to 17.8 ug/L and in five filtered samples at estimated concentrations ranging from 1.2 ug/L to 2.5 ug/L. [NOTE: Samples in which chromium was detected at concentrations less than five times the associated blank contamination are flagged with a "P" in Table 6.1 and were considered to be not detected.]

Lead

Lead was not present in ground-water samples collected from Residuum/Transition Zone wells during Round V and Round VI sampling activities in concentrations exceeding the ROD-specified clean-up level of 15 ug/L. Lead was detected in five unfiltered samples at estimated concentrations ranging from 0.8 ug/L to 2.2 ug/L. Lead was not detected in the filtered samples. [NOTE: Samples in which lead was detected at concentrations less than five times the associated blank contamination are flagged with a "P" in Table 6.1 and were considered to be not detected.]

Based on the results of the Round V and Round VI analytical results, antimony, beryllium, chromium and lead are not present in the Residuum/Transition Zone, or, if present, are not present in concentrations exceeding ROD-specified clean-up levels. The data are shown on Figure 6.1.

6.1.1.2 Upper Ocala Wells

Antimony

Antimony was not present in ground-water samples collected from Upper Ocala wells during Round V and Round VI sampling activities in concentrations exceeding the ROD-specified clean-up level of 6 ug/L. Antimony was detected in one unfiltered sample at estimated concentrations of 2.2 ug/L. Antimony was not detected in the filtered samples.

Beryllium

Beryllium was not present in ground-water samples collected from Upper Ocala wells during Round V and Round VI sampling activities. [NOTE: Samples in which beryllium was detected at concentrations less

than five times the associated blank contamination are flagged with a "P" in Table 6.2 and were considered to be not detected.]

Chromium

Chromium was not present in ground-water samples collected from Upper Ocala wells during Round V and Round VI sampling activities in concentrations exceeding the ROD-specified clean-up level of 100 ug/L. Chromium was detected in one unfiltered samples at a concentration of 22.6 ug/L and in one filtered sample at a concentration of 23.9 ug/l. [NOTE: Samples in which chromium was detected at concentrations less than five times the associated blank contamination are flagged with a "P" in Table 6.2 and were considered to be not detected.]

Lead

Lead was not present in ground-water samples collected from Upper Ocala wells during Round V and Round VI sampling activities in concentrations exceeding the ROD-specified clean-up level of 15 ug/L. Lead was detected in one unfiltered samples at a concentration of 5.9 ug/L and in one filtered sample at a concentration of 4.9. [NOTE: Samples in which lead was detected at concentrations less than five times the associated blank contamination are flagged with a "P" in Table 6.2 and were considered to be not detected.]

Based on the results of the Round V and Round VI analytical results, antimony, beryllium, chromium and lead are not present in the Upper Ocala, or, if present, are not present in concentrations exceeding ROD-specified clean-up levels. The data are shown on Figure 6.2.

6.1.1.3 Lower Ocala Wells

Antimony

Antimony was not present in ground-water samples collected from Lower Ocala wells during Round V and Round VI sampling activities in concentrations exceeding the ROD-specified clean-up level of 6 ug/L. Antimony was detected in one unfiltered sample at an estimated concentrations of 2.0 ug/L and in one filtered sample at an estimated concentration of 2.8 ug/L.

Beryllium

Beryllium was not present in ground-water samples collected from Lower Ocala wells during Round V and Round VI sampling activities. [NOTE: Samples in which beryllium was detected at concentrations less than five times the associated blank contamination are flagged with a "P" in Table 6.3 and were considered to be not detected.]

Chromium

Chromium was not present in ground-water samples collected from Lower Ocala wells during Round V and Round VI sampling activities in concentrations exceeding the ROD-specified clean-up level of 100 ug/L. Chromium was detected in three unfiltered samples at concentrations ranging from 10.6 ug/L to 17.6 ug/L and in three filtered samples at concentrations ranging from 7.8 ug/l (estimated) to 14.9 ug/L. [NOTE: Samples in which chromium was detected at concentrations less than five times the associated blank contamination are flagged with a "P" in Table 6.3 and were considered to be not detected.]

Lead

Lead was not present in ground-water samples collected from Upper Ocala wells during Round V and Round VI sampling activities in concentrations exceeding the ROD-specified clean-up level of 15 ug/L. Lead was detected in three unfiltered samples at estimated concentrations ranging from 0.8 ug/L to 1.5 ug/L. Lead was not detected in the filtered samples. [NOTE: Samples in which lead was detected at concentrations less than five times the associated blank contamination are flagged with a "P" in Table 6.3 and were considered to be not detected.]

Based on the results of the Round V and Round VI analytical results, antimony, beryllium, chromium and lead are not present in the Lower Ocala, or, if present, are not present in concentrations exceeding ROD-specified clean-up levels. The data are shown on Figure 6.3.

6.1.1.4 Summary of Inorganics Monitoring Study Data

No inorganic of interest was detected during Rounds V and VI at a concentration exceeding the ROD-specified clean-up level. As indicated in Figures 6.1, 6.2, and 6.3, detections of the inorganics of interest are low (generally below the CRDL) and randomly spaced across the site within and across hydrostratigraphic units. This random distribution of detections lends additional support to the postulation that there is a naturally-occurring source for the inorganics of interest. Because the inorganics of interest

are not present in ground water at concentrations exceeding the ROD-specified clean-up levels, no statistical analysis was necessary.

6.1.2 Comparison of RI and Inorganics Monitoring Study Data

Review of data collected during the RI (Rounds I through IV) indicate that the inorganics of interest were detected at concentrations exceeding ROD-specified clean-up levels for the most part only in Round I, and to a lesser extent, Round II. Subsequent analysis of ground water obtained from wells which had exhibited elevated concentrations of the inorganics of interest in Rounds I and II yielded significantly lower concentrations of the inorganics of interest. Table 6.4 presents the range of detected concentrations of the inorganics of interest by each sampling round. Lower concentrations of the inorganics of interest in ground water for the subsequent sampling events, and the lower concentrations of filtered samples compared to unfiltered samples in Rounds II, III, and IV, can be attributed to the presence of suspended solids in samples. As discussed in Section 4.2, USEPA and others have been conducting studies of the impact of purging techniques on analyte concentrations due to entrainment of solids in the water column. Upon digestion in the laboratory, metals intrinsic to native soils can be leached from suspended solids into the sample, resulting in elevated and nonrepresentative concentrations of metals. Further, background and regional data indicate that the inorganics of interest occur naturally in the soils and sediments in the Albany, Georgia area and would be expected to be present in solids entrained in ground-water samples. The data lead to the conclusion that solids were entrained in samples collected during the RI as discussed below:

- During Round I sampling, an entire analytical suite of samples (volatile, semi-volatile, pesticides/PCBs, and metals) were collected from each well, thus requiring collection of at least three to four liters of ground water. The metals fraction was collected last during Round I and, as a result, was generally the most turbid fraction. In Rounds II, III and IV, ground water was collected only for metals analysis as opposed to the full Target Compound List / Target Analyte List collected during Round I of the RI. As a result, fewer bailer volumes were necessary which would be expected to reduce the amount of solids entrained in the sample. It is well established that more turbid samples, containing more solids, will generally have higher metals concentrations.
- Samples collected in Rounds I and II were, in many cases, obtained from wells that had been recently installed. Newly installed wells have not had the opportunity to allow stabilization of filter packs in the annular space between the well screen and the formation. A stabilized

filter pack helps to reduce the amount of artificially entrained solids in the water column. It is likely that, by the time Round III and Round IV events took place, the filter pack had stabilized and reduced the amount of solids in the samples collected during these rounds.

- Purging during Rounds I through IV and sampling during Rounds I and II were not conducted in a manner specifically designed to limit the entrainment of solids in the water column (personal communication with WCC personnel). Samples were collected in Rounds III and IV using more quiescent sampling techniques, which reduced the amount of artificially entrained solids in the column as compared to Rounds I and II. Wells were purged using low flow pumping techniques in Rounds V and VI, and ground-water samples were collected from these wells using quiescent sampling techniques.

As a result of sampling techniques used during the RI, one would expect samples collected during the RI to contain more solids and, therefore, to exhibit concentrations of metals that are biased high, thereby being less representative of formation water than the samples collected in Rounds V and VI. As described in Sections 5.1.3 and 5.1.4, ground-water samples obtained during Rounds V and VI were collected using low flow purging and quiescent sampling techniques to limit the amount of solids entrained in the water column. Analysis of the final purged ground water for turbidity and comparison of analyte concentrations detected in filtered and non-filtered samples collected during Rounds V and VI indicate that the amount of suspended solids was limited in the samples, resulting in a sample that was therefore more representative of ground-water quality for metallic analytes. Comparison of results from unfiltered versus filtered sample results confirms the representativeness of the samples collected during Rounds V and VI by indicating that artificial levels of solids were not present in the unfiltered samples.

6.2 CARBON DISULFIDE

CS₂ was not present in ground-water samples collected during Round V and Round VI sampling activities in concentrations exceeding the ROD-specified clean-up level of 56 ug/L. CS₂ was detected in four samples at concentration ranging from 1 ug/L (estimated) to 36 ug/L (Figure 6.4). The presence of CS₂ in QC samples supports the hypothesis that CS₂ is present at the site in small concentrations due to ambient conditions. Because CS₂ was not present in ground water at concentrations exceeding the ROD-specified clean-up level (which is equivalent to the risk based hazard index of 1), no statistical analysis was necessary.

As discussed in Section 4.3, several conditions at the site may provide natural or background sources of CS_2 .

- CS_2 is produced during anaerobic biodegradation and microbial reduction of sulfates in saturated soils. The southern and northwestern portion of the Firestone site contain wetlands, the saturated soils are a potential source of CS_2 .
- Plants which have been shown to emit CS_2 include mimosa, white oak, and marsh grass. As determined by the ecological study conducted during the RI, the site is vegetated with mimosa, marsh grasses, and a variety of oaks. Figure 6.5 depicts the locations of the vegetation. As discussed above, these plants have been shown to emit CS_2 .
- CS_2 is used as a soil fumigator to control fungi and weeds. Prior to 1968, the site was farmed, and it is possible that CS_2 was applied to the soil as a fumigant.
- CS_2 may be released during the manufacture of rubber chemicals. During all sampling events, Cooper Tire & Rubber Company was actively manufacturing tires. Ambient conditions from the manufacturing operations are a potential source of CS_2 .
- CS_2 was also detected at a high frequency in field and laboratory blanks, indicating that the presence of CS_2 could be due to laboratory contamination.

CS_2 was not used as a solvent in the manufacturing operations conducted by Firestone Tire & Rubber Company. As shown in Figure 6.4, the presence of CS_2 appears to be random across the site and was not detected in the courtyard area, which was the location of known solvent releases. If CS_2 had been released as a result of manufacturing operations, it is unlikely that the release would be in an area remote from other known solvent releases. Furthermore, if CS_2 were released on land, it would primarily be lost through volatilization due to its high vapor pressure and low propensity to adsorb to soil. Due to these characteristics it is unlikely that a release of CS_2 could linger in the soil column unless a continuous source were present. As determined by the RI, CS_2 is not present in soils at concentrations that suggest any source is or has been present at the site. Therefore, the deduction follows that CS_2 is being generated continuously at low concentrations due to natural processes or manufacturing operations in the area.

6.3 IDENTIFICATION OF BACKGROUND WELLS

As summarized in Section 5.2, the results of the Inorganics Monitoring Study confirm the location of background wells identified during RI activities.

- Well BMW-2A was used as the Residuum/Transition Zone background well. While it is likely that ground water observed in the Residuum is present as unconnected perched zones, well BMW-2A is hydraulically upgradient of the other Residuum wells at the site and is located in an area (baseball field) where no known manufacturing or disposal practices were conducted.
- Well RW-10A was used as the Upper Ocala background well. The direction of ground-water flow in the Upper Ocala is towards the southwest in the northern portion of the site. Well RW-10A is located in the northeastern corner of the site, hydraulically upgradient of the manufacturing activities.
- Well DRW-11 was used as the Lower Ocala background well. The direction of ground-water flow in the Lower Ocala is towards the southwest across the site. Well DRW-11 is located in the northeastern corner of the site, hydraulically upgradient of the manufacturing activities.

7.0 CONCLUSIONS AND RECOMMENDATIONS

Section 7 presents conclusions derived from the Inorganics Monitoring Study and recommendations.

7.1 INORGANICS OF INTEREST

The results of the Inorganics Monitoring Study indicate that the inorganics of concern (antimony, beryllium, chromium and lead) were all naturally occurring in site soils. The results and conclusions of the study lead to the conclusion that the inorganics detected during earlier investigations and the RI at concentrations exceeding ROD-specified clean-up levels were due to soil solids suspended in ground-water samples. Finally, the inorganics of interest are not present in ground water above ROD-specified clean-up levels.

Based on the results and conclusions of the Inorganics Monitoring Study, no further action is recommended to address antimony, beryllium, chromium, and lead.

7.2 CARBON DISULFIDE

CS₂ is naturally occurring as a result of wetland soils, plant species or other ambient conditions at the site. The results of the Inorganics Monitoring Study lead to the conclusion that previous detections of carbon disulfide were due to natural or background conditions at the site at the time of sampling or a result of laboratory contamination. Finally, carbon disulfide is not present in ground water at concentrations exceeding ROD-specified clean-up levels.

Based on the results and conclusions of the Inorganics Monitoring Study, no further action is recommended to address carbon disulfide in ground water at the site.

8.0 REFERENCES

- Abrams, E.F., 1975. *Identification of Organic Compounds in Effluents from Industrial Sources* USEPA 560/3-75/002
- Adams, D.F., S.O. Farwell, M.R., W.L. Barnesberger, 1979. "Preliminary measurements of biogenic sulfur-containing gas emissions from soils", *JAPCA* 29(4), 1979.
- Backhus, D.A., J.A. Ryan, D.M. Groher, J.K. MacFarlane, 1993. "Sampling Colloids and Colloid-Associated Contaminants in Ground Water", *Ground Water*, 31(3), 1993.
- Carroll, M.A., 1985. *J Geophys Res* 90, 1985
- Chapman, M.J., B.M. Gallaher, and D.A. Early, 1990. *A Preliminary Investigation of the Hydro Geology and Contamination in the Area of an Abandoned Manufactured Gas Plant in Albany, Georgia*, U.S. Geological Survey, Doraville, Georgia.
- "Chemical Profiles", *Chemical Marketing Reporter*, Jan 13, 1986
- Farwell, S.O., et al; *Soil Biol Biochem* 11: 411-5 (1979)
- Haines, B.; Black, M.; Fail, J., Jr.; McHargue, L.; Howell, G. "Potential sulphur gas emissions from a tropical rainforest and a southern Appalachian deciduous forest", *Effects of atmospheric pollutants on forests, wetlands and agricultural ecosystems*, Vol. G16. Hutchinson, T.C.; Meema, K.M., eds. P.599-610. NATO ASI Series. Berlin: Springer-Verlag (1987)
- Hicks, D.W., R.E. Krause, and J.S. Clarke, 1981. *Geohydrology of the Albany Area, Georgia*, Information Circular 57, Georgia Geologic Survey, Atlanta, Georgia, 1981.
- Hicks, D.W., H.E. Gill, and S.A. Longsworth, 1987. *Hydrogeology, Chemical Quality and Availability of Ground Water in the Upper Floridan Aquifer, Albany Area, Georgia*, Water Resources Investigation Report 87-4145, United States Geological Survey, Doraville, Georgia, 1987.
- Hines, M.E., 1993. "Emissions of sulfur gases from wetlands" *Cycling of reduced gases in the hydrosphere*, ed. D.D. Adams, P.M. Crill, S.P. Seitzinger, Stuttgart, Germany: E. Schweizerbart'sche Verlagsbuchhandlungen, 1993.
- Khalil, M.A.K., R.A. Rasmussen, 1984. *Atmos Environ* 18, 1984.
- Law Engineering and Environmental Services, Inc. (LAW), 1995. *Prefinal 90% Remedial Design Report, Firestone Tire & Rubber Company Site, Albany, Georgia*, Kennesaw, Georgia, 1995.
- Law Environmental, Inc. (LAW), 1994. *Soil Remediation Report, Firestone Rubber & Tire Facility, Albany, Georgia*, Kennesaw, Georgia, 1994.
- Law Environmental, Inc. (LAW), 1995a. *Detailed Sampling and Analysis Plan, Firestone Tire & Rubber Site, Albany, Georgia*, Kennesaw, Georgia, 1995.

- Law Environmental, Inc. (LAW), 1995b. *Inorganics Monitoring Work Plan, Firestone Tire & Rubber Site, Albany, Georgia, Kennesaw, Georgia*, 1995.
- Lovelock, J.E., 1974. *Nature*, 248, 1974.
- Puls, R.W. and R.M. Powell, 1992a. "Acquisition of Representative Ground Water Quality Samples for Metals", *Ground Water Monitoring Review*, 12(3), 1992
- Puls, R.W., D.A. Clark, B. Bledsoe, R.M. Powell, and C.J. Pauls, 1992b. "Metals in Ground Water: Sampling Artifacts and Reproducibility", *Hazardous Waste and Hazardous Materials*, 9(2), 1992
- Shacklette, H.T., and J.A. Boerngen, 1981. *Chemical Analysis of Soils and Other Surficial Materials of the Conterminous United States*, Open File Report 81-197, United States Geological Survey, Washington, D.C., 1984.
- Shacklette, H.T., and J.A. Boerngen, 1984. *Element Concentrations in Soils and Other Surficial Materials of the Conterminous United States*, Professional Paper 1270, United States Geological Survey, Washington, D.C., 1984.
- USGS, 1993. Torak, L.J., J.S. Davis, G.A. Strain, and J.G. Herndon, *Geohydrology and Evaluation of Water Resource Potential of the Upper Floridan Aquifer in the Albany Area, Southwestern Georgia*, Water Supply Paper 2391, United States Geologic Survey.
- United States Environmental Protection Agency, 1988. *Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analysis*, Washington, D. C., 1988.
- United States Environmental Protection Agency, 1991. *Contract Laboratory Program National Functional Guidelines for Organic Data Review*, Washington, D. C., 1991.
- United States Environmental Protection Agency (Region IV), 1991. *Environmental Compliance Branch Standard Operating Procedures and Quality Assurance Manual*, Athens, Georgia, 1991.
- United States Environmental Protection Agency, 1992. *Contract Laboratory Program Statement of Work for Organics Analysis*, OLM01.8, Sample Management Office, Cincinnati, Ohio, 1992.
- United States Environmental Protection Agency, 1993. *Contract Laboratory Program Statement of Work for Inorganics Analysis*, ILM03.0, Sample Management Office, Cincinnati, Ohio, 1993.
- United States Environmental Protection Agency, 1995. *Ground Water Sampling - A Workshop Summary*, Robert S. Kerr Environmental Research Laboratory, Office of Research and Development, Ada, Oklahoma, 1995.
- Westberg, H., B. Lamb, 1984. "Estimation of biogenic sulfur emissions from the continental U.S. In: Environmental impact of natural emissions", *Trans. Air Pollution Control Association Specialty Conference (TR-2)*, Pittsburgh, PA, 1984.

- Woodward-Clyde Consultants, 1991a. *Field Sampling and Analysis Plan for Investigations of Firestone Tire & Rubber Company, Former Firestone Rubber & Tire Facility, Albany, Georgia, Chicago, Illinois, 1991.*
- Woodward-Clyde Consultants, 1991b. *Quality Assurance Project Plan, Albany, Georgia, Chicago, Illinois, 1991.*
- Woodward-Clyde Consultants, 1992a. *Addendum to the Remedial Investigation Report, June 1992 Groundwater and Soil Sampling, Former Firestone Rubber & Tire Facility, Albany, Georgia, Chicago, Illinois.*
- Woodward-Clyde Consultants, 1992b. *Feasibility Study Report, Former Firestone Rubber & Tire Facility, Albany, Georgia, Chicago, Illinois.*
- Woodward-Clyde Consultants, 1992c. *Remedial Investigation Report, Former Firestone Rubber & Tire Facility, Albany, Georgia, Chicago, Illinois.*
- Woodward-Clyde Consultants, 1993. *Impact of Phase II, III, and IV Remedial Investigation Data on the Baseline Risk Assessment, Former Firestone Rubber & Tire Facility, Albany, Georgia, Chicago, Illinois.*

TABLES

Table 2.1. Ground-Water Monitoring Well Summary

Well Number	Date Installed	Surface Elevation (feet, msl)	Total Depth (feet, bgs)	Depth to Top of Screen (feet, bgs)	Well Type	Sampling Events
<u>Residuum Transition Zone</u>						
BMW-2A	Mar-95	213.4	20.0	10.0	II	V, VI
BMW-2*	Feb-86	210.6	15.0	5.0	II	I, II, III
BMW-3	Feb-86	214.0	50.5	36.0	II	I, III, V, VI
BMW-4	May-86	217.1	45.5	35.0	II	I
EMG-1	Dec-89	213.1	56.5	42.0	II	I
EMG-2	Dec-89	216.5	67.0	56.0	II	I, III, V, VI
EMG-5A*	Dec-89	214.8	19.0	15.0	II	I, III
EMG-6	Jan-90	205.1	46.0	34.0	II	I, III, IV, V, VI
EMG-7	Dec-89	202.8	41.0	30.0	II	I, II, III, V, VI
MW-1-1	Jan-86	213.4	60.5	49.0	II	I, III
MW-1-2	May-86	214	35.5	25.0	II	I, II, III, V, VI
MW-1-3	May-86	212.1	65.5	55.0	II	I, III, V, VI
MW-1-4	May-86	212.6	35.5	23.0	II	I, III, IV, V, VI
MW-1-5*	May-86	212.2	60.0	50.0	II	I, III, V, VI
MW-1-5A	Mar-95	212.2	61.0	51.0	II	I, III, V, VI
MW-1-6*	Oct-86	214.5	59.0	49.0	II	I, III, V, VI
MW-1-6A	Mar-95	214.5	59.0	49.0	II	I, III, V, VI
MW-7-4	Feb-86	214.8	40.0	29.0	II	.
MW-7-5	May-86	212.9	50.5	40.0	II	I, III, V, VI
MW-7-8	May-86	212.6	35.5	25.0	II	I
MW-9-1*	Jan-86	212.2	45.5	34.0	II	
MW-9-2*	Jan-86	211.2	35.5	23.0	II	
MW-12-1	Jan-86	206.3	26.0	16.0	II	I
MW-12-1B	Aug-91	207.5	33.0	22.0	II	I
MW-14	Aug-91	214.6	57.0	46.0	II	I, III, V, VI
PTW-1	Feb-90	212.5	84.3	13.0	II	I
RW-1	Oct-86	213.5	71.0	61.0	II	I
RW-2	Oct-86	214.1	59.0	49.0	II	II, III
RW-3	Oct-86	214.5	68.0	58.0	II	I, V, VI
<u>Upper Ocala Wells</u>						
DRW-1	Feb-90	214.4	130.6	120.0	II	
DRW-2	Feb-90	214.3	134.5	124.0	II	I
DRW-3	Feb-90	214.3	135.2	125.0	II	I
DRW-4	Feb-90	214.4	130.6	121.0	II	I
DRW-8	Sep-91	214.6	131.0	90.0	III	I
EMG-3	Dec-89	213.3	59.0	48.0	II	I
EMG-5B	Dec-89	214.5	66.0	55.0	II	I, III, V, VI
MW-13	Sep-91	214.6	105.5	95.0	III	I
RW-4	Aug-91	212.0	90.0	80.0	III	I, II
RW-5	Jun-91	213.3	72.0	58.5	III	I
RW-6	Jul-91	214.4	92.0	81.0	III	I
RW-7	Sep-91	214.5	110.0	95.0	III	I
RW-8	Jun-91	206.9	68.0	52.0	III	I
RW-9	Jun-91	204.6	67.0	50.0	III	I, II
RW-10*	Sep-91	214.7	60.5	50.5	III	I, II, III
RW-10A	Feb-95	215.0	63.0	52.0	III	V, VI
<u>Lower Ocala Wells</u>						
DRW-5	Aug-91	212.3	178.0	166.0	IV	I, II, III, V, VI
DRW-6A	Jun-91	212.3	173.0	160.0	IV	I
DRW-7A	Aug-91	206.5	193.0	180.0	IV	I
DRW-8	Sep-91	214.6	135.0	90.0	IV	
DRW-9	Aug-91	214.6	190.0	178.0	IV	I
DRW-10	Aug-91	204.1	170.0	160.0	IV	I, II
DRW-11	Aug-91	214.6	174.0	159.5	IV	I, II, III, V, VI
OW-1	Aug-67	214.5	270.0	119.6	II	I
OW-2	Sep-67	216.5	306.0	270.0	II	I, III, V, VI

Notes: * - Monitoring well was abandoned in February/March 1995.

II - Denotes a single cased well.

III - Denotes a double cased well.

IV - Denotes a triple cased well.

Entered by: AC 10/2/95

Checked by: JAM 10/2/95

Table 2.2. Analytical Results from the RI for the Constituents of Interest: Residuum and Transition Zone Wells

	PCL	BMW-2		BMW-3		BMW-4		EMIG-1		EMIG-2		EMIG-5A		EMIG-6		EMIG-7	
		NF	F	NF	F	NF	F	NF	F	NF	F	NF	F	NF	F	NF	F
Antimony, ug/L	6																
Round I		82.3	--	15.7U	--	11.6U	--	17.6U	--	22.4U	--	11.5U	--	64.1	--	9.0U	--
Round II		9.8B	12.1B	--	--	--	--	--	--	--	--	--	--	--	--	54.7B	22.2B
Round III		17.4U	17.4U	--	--	--	--	--	--	--	--	--	--	17.4U	17.4U	17.4U	17.4U
Round IV		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Beryllium, ug/L	4																
Round I		4.8B	--	2.1B	--	1.2B	--	2.5B	--	1.5B	--	6.5	--	10.7	--	1.0U	--
Round II		1.0U	1.0U	--	--	--	--	--	--	--	--	--	--	--	--	1.7B	3.5B
Round III		0.7U	0.7U	--	--	--	--	--	--	--	--	2.4B	0.7U	27	0.7U	--	--
Round IV		--	--	--	--	--	--	--	--	--	--	--	--	4	2.0U	--	--
Chromium, ug/L	100																
Round I		143	--	33.7	--	13.6	--	9.8B	--	6.4B	--	39.5	--	69.6	--	3.0U	--
Round II		6.0U	6.0U	--	--	--	--	--	--	--	--	--	--	--	--	40.3J	11.8J
Round III		4.6U	4.6U	--	--	--	--	--	--	--	--	--	--	51.5	4.6U	--	--
Round IV		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lead, ug/L	15																
Round I		56.7	--	25.8	--	6.6	--	7.1	--	25.4	--	18.2	--	10.5	--	3.9	--
Round II		2.3B	1.0U	--	--	--	--	--	--	--	--	--	--	--	--	11.3S	1.0U
Round III		2.5B	0.6U	1.2B	0.6U	--	--	--	--	7.3	0.6U	8.4	1.0B	--	--	--	--
Round IV		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Carbon Disulfide, ug/L	56																
Round I		54	NA	23	NA	260	NA	511	NA	511	NA	10	NA	10	NA	130	NA

Notes: PCL - Potential Clean up Level

NF - Sample was not filtered prior to analysis.

-- No sample was collected

B - Indicates an estimated value which is less than the C' RDL, but greater than the HDL.

F - Sample was filtered prior to analysis

J - Indicates an estimated value

S - Indicates a reported value determined by Method of Standard Addition.

U - Analyte was not detected at the reported detection limit

NA - Not Applicable

Round I - August - October 1991

Round II - December 1991

Round III - June 1992

Round IV - December 1992

Table 2.2. Analytical Results from the RI for the Constituents of Interest: Residuum and Transition Zone Wells

	PCL	MW-1-1		MW-1-2		MW-1-3		MW-1-4		MW-1-5		MW-1-6		MW-7-5		MW-7-8	
		NF	F	NF	F	NF	F	NF	F	NF	F	NF	F	NF	F	NF	F
Antimony, ug/L	6																
Round I		28.4U	--	17.4U	--	21.6U	--	54.7U	--	27.8U	--	9.0U	--	119	--	24.2U	--
Round II		--	--	9.5B	7.0U	--	--	--	--	--	--	--	--	--	--	--	--
Round III		--	--	17.4U	17.4U	--	--	--	--	--	--	--	--	17.4U	17.4U	--	--
Round IV		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Beryllium, ug/L	4																
Round I		1.7B	--	1.0U	--	3.6B	--	4.3B	--	13.2	--	8.1	--	45.7	--	1.0U	--
Round II		--	--	1.0U	1.0U	--	--	--	--	--	--	--	--	--	--	--	--
Round III		--	--	--	--	--	--	0.71B	1.2	2.3B	0.7U	0.7U	0.7U	2.3B	0.93B	--	--
Round IV		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chromium, ug/L	100																
Round I		53.9	--	14.1U	--	184	--	72.9	--	72.4	--	160	--	157	--	31.8U	--
Round II		--	--	6.0U	6.0U	--	--	--	--	--	--	--	--	--	--	--	--
Round III		5.9B	4.6U	--	--	5.1B	4.6U	30	4.6U	8.1B	4.6U	5.5B	4.6U	11.1	5.7B	--	--
Round IV		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lead, ug/L	15																
Round I		14.1	--	4.7U	--	92.2S	--	37.7	--	82.4S	--	91.6	--	114	--	8.2U	--
Round II		--	--	7.2	1.0U	--	--	--	--	--	--	--	--	--	--	--	--
Round III		--	--	--	--	2.6B	0.6B	18.8	1.4B	11.7	0.6U	12.3	0.6U	11.9	0.6U	--	--
Round IV		--	--	--	--	--	--	7.0	2.0	--	--	--	--	--	--	--	--
Carbon Disulfide, ug/L	56																
Round I		21	NA	5U	NA	5U	NA	--	NA	3J	NA	5U	NA	10	NA	77	NA

Notes: PCL - Potential Clean-up Level

NF - Sample was not filtered prior to analysis.

-- - No sample was collected

B - Indicates an estimated value which is less than the CRDL, but greater than the HDL.

F - Sample was filtered prior to analysis

J - Indicates an estimated value

S - Indicates a reported value determined by Method of Standard Addition.

U - Analyte was not detected at the reported detection limit.

NA - Not Applicable

Round I - August - October 1991

Round II - December 1991

Round III - June 1992

Round IV - December 1992

Table 2.2. Analytical Results from the RI for the Constituents of Interest: Residuom and Transition Zone Wells

	PCL	MW-12-1*		MW-12-1B		MW-14		PTW-1		RW-1		RW-2		RW-3	
		NF	F	NF	F	NF	F	NF	F	NF	F	NF	F	NF	F
Antimony, ug/L	6														
Round I		19.5U/13.3	--	22.4U	--	74.6	--	9.0U	--	32.1U	--	--	--	20.1U	--
Round II		--	--	--	--	--	--	--	--	--	--	9.0U	7.0U	--	--
Round III		--	--	--	--	17.4U	17.4U	--	--	--	--	17.4U	17.4U	--	--
Round IV		--	--	--	--	--	--	--	--	--	--	--	--	--	--
Beryllium, ug/L	4														
Round I		1.0U/1.0U	--	2.0B	--	1.0U	--	1.0U	--	1.0U	--	--	--	4.5B	--
Round II		--	--	--	--	--	--	--	--	--	--	1.0U	1.0U	--	--
Round III		--	--	--	--	--	--	--	--	--	--	--	--	--	--
Round IV		--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chromium, ug/L	100														
Round I		15U/15U	--	25.6	--	64.4	--	3.0U	--	22.0U	--	--	--	13.5	--
Round II		--	--	--	--	--	--	--	--	--	--	8.9JB	6.0U	--	--
Round III		--	--	--	--	4.6U	4.6U	--	--	--	--	--	--	--	--
Round IV		--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lead, ug/L	15														
Round I		4.8U/4.8U	--	7.5	--	15.9	--	3.1S	--	1.6U	--	--	--	9.2	--
Round II		--	--	--	--	--	--	--	--	--	--	1.5J	1.0U	--	--
Round III		--	--	--	--	2.1B	0.8B	--	--	--	--	--	--	1.9B	0.6U
Round IV		--	--	--	--	--	--	--	--	--	--	--	--	--	--
Carbon Disulfide, ug/L	56														
Round I		18/4J	NA	4J	NA	5U	NA	5U	NA	14	NA	5U	NA	10	NA

Notes: PCL - Potential Clean-up Level
 NF - Sample was not filtered prior to analysis.
 -- - No sample was collected
 B - Indicates an estimated value which is less than the CRDL,
 but greater than the HDL.
 F - Sample was filtered prior to analysis
 J - Indicates an estimated value
 S - Indicates a reported value determined by Method of Standard Addition.
 U - Analyte was not detected at the reported detection limit.
 * - Well MW-12-1 was sampled twice during Round I.
 NA - Not Applicable

Entered by: TWS 4/19/94, JAM 4/5/95
 Checked by: JAM 5/11/94, MJP 4/13/95

Source: Remedial Investigation Report, June 1992
 Addendum to Remedial Investigation Report, June 1992
 Impact of Phase II, III, and IV Remedial Investigation Data
 on the Baseline Risk Assessment, January 1993
 Feasibility Study, December 1992
 Former Firestone Tire and Rubber Company Facility
 Albany, Georgia. Woodward Clyde Consultants

Table 2.3. Analytical Results from the RI for Constituents of Interest: Upper Ocala Wells

	PCL	EMG-3		EMG-5		MW-13		RW-4		RW-5		RW-6		RW-7	
		NF	F	NF	F	NF	F	NF	F	NF	F	NF	F	NF	F
Antimony, ug/L	6														
Round I		17.7U	--	16.4U	--	18.9U	--	7.0U	--	7.0U	--	15.2U	--	13.5U	--
Round II		--	--	--	--	--	--	7.0U	7.0U	--	--	--	--	--	--
Round III		--	--	--	--	--	--	--	--	--	--	--	--	--	--
Round IV		--	--	--	--	--	--	--	--	--	--	--	--	--	--
Beryllium, ug/L	4														
Round I		2.5B	--	5.2	--	1.0U	--	1.0U	--	1.0U	--	1.0U	--	1.0U	--
Round II		--	--	--	--	--	--	1.0U	1.0U	--	--	--	--	--	--
Round III		--	--	2.5B	0.7U	--	--	--	--	--	--	--	--	--	--
Round IV		--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chromium, ug/L	100														
Round I		10.3	--	28.5	--	10.2	--	16.1	--	9.3B	--	7.6B	--	13.1	--
Round II		--	--	--	--	--	--	17.1J	6.0U	--	--	--	--	--	--
Round III		--	--	--	--	--	--	--	--	--	--	--	--	--	--
Round IV		--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lead, ug/L	15														
Round I		7.5	--	12.5	--	1.3B	--	1.1B	--	1.0U	--	2.2B	--	3.8	--
Round II		--	--	--	--	--	--	1.1B	1.0U	--	--	--	--	--	--
Round III		--	--	--	--	--	--	--	--	--	--	--	--	--	--
Round IV		--	--	--	--	--	--	--	--	--	--	--	--	--	--
Carbon Disulfide, ug/L	56														
Round I		10U	NA	10	NA	10U	NA	2J	NA	0.8J	NA	5J	NA	2J	NA

Notes: PCL - Potential Clean-up Level

NF - Sample was not filtered prior to analysis

F - Sample was filtered prior to analysis

-- - No sample was collected

U - Analyte was not present in detectable concentrations

J - Indicates an estimated value

B - Indicates an estimated value which is less than the CRDL, but greater than the HDL

NA - Not Applicable

Round I - August - October 1991

Round II - December 1991

Round III - June 1992

Round IV - December 1992

Table 2.3. Analytical Results from the RI for Constituents of Interest: Upper Ocala Wells

	PCL	RW-8		RW-9		RW-10		DRW-2		DRW-3		DRW-4		DRW-8	
		NF	F	NF	F	NF	F	NF	F	NF	F	NF	F	NF	F
Antimony, ug/L.	6														
Round I		7.0U	--	7.0U	--	63	--	9.0U	--	14.3U	--	9.0U	--	16.1U	--
Round II		--	--	7.0U	7.0U	26.9B	27.9B	--	--	--	--	--	--	--	--
Round III		--	--	--	--	17.4U	17.4U	--	--	--	--	--	--	--	--
Round IV		--	--	--	--	--	--	--	--	--	--	--	--	--	--
Beryllium, ug/L.	4														
Round I		1.0U	--	1.0U	--	1.0U	--	1.0U	--	1.0U	--	1.0U	--	1.0U	--
Round II		--	--	1.0U	1.0U	1.0U	1.0U	--	--	--	--	--	--	--	--
Round III		--	--	--	--	1.2B	1.2B	--	--	--	--	--	--	--	--
Round IV		--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chromium, ug/L.	100														
Round I		28.6	--	13.2	--	105	--	4.3U	--	3.0U	--	3.0U	--	11.8	--
Round II		--	--	6.0U	6.0U	61.7J	50.8J	--	--	--	--	--	--	--	--
Round III		--	--	--	--	23.5	25.8	--	--	--	--	--	--	--	--
Round IV		--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lead, ug/L.	15														
Round I		2.7B	--	2.9B	--	8.9	--	2.1B	--	1.6B	--	3.3	--	4.6	--
Round II		--	--	1.0U	1.0U	2.6BS	1.0U	--	--	--	--	--	--	--	--
Round III		--	--	--	--	1.0B	0.6U	--	--	--	--	--	--	--	--
Round IV		--	--	--	--	--	--	--	--	--	--	--	--	--	--
Carbon Disulfide, ug/L.	56														
Round I		10U	NA	10U	NA	10U	NA	10U	NA	42	NA	10U	NA	2BJ	NA

Notes: PCL - Potential Clean-up Level

NF - Sample was not filtered prior to analysis

F - Sample was filtered prior to analysis

-- - No sample was collected

U - Analyte was not present in detectable concentrations

S - Indicates a reported value determined by Method of Standard Addition

J - Indicates an estimated value

B - Indicates an estimated value which is less than the CRDL but greater than the RDL

NA - Not Applicable

Entered by: TWS 4/19/94, JAM 4/5/95

Checked by: JAM 5/11/94, MB P 4/13/95

Source: Remedial Investigation Report, June 1992
 Addendum to Remedial Investigation Report, June 1992
 Impact of Phase II, III, and IV Remedial Investigation Data
 on the Baseline Risk Assessment, January 1993
 Feasibility Study, December 1992
 Former Limestone Tire and Rubber Company Facility
 Albany, Georgia, Woodward Clyde Consultants

Table 2.4. Analytical Results from the RI for Constituents of Interest: Lower Ocala Wells

	PCL	OW-1		OW-2		PW-1		PW-2		DRW-5		DRW-6A		DRW-7A		DRW-9		DRW-10		DRW-11*	
		NF	F	NF	F	NF	F	NF	F	NF	F	NF	F	NF	F	NF	F	NF	F	NF	F
Antimony, ug/L	6																				
Round I		9.0U	--	9.0U	--	26U	--	7.6U	--	7.0U	--	7.0U	--	7.0U	--	7.0U	--	8.9U	--	7.0U/7.0U	--
Round II		--	--	--	--	--	--	--	--	3.0U	3.0U	--	--	--	--	--	--	3.0U	3.0U	3.0U	6.8B
Round III		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	17.4U	17.4U
Round IV		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Beryllium, ug/L	4																				
Round I		1.0U	--	1.0U	--	1.0U	--	1.0U	--	1.0U	--	1.0U	--	1.0U	--	1.0U	--	1.0U	--	1.0U/1.0U	--
Round II		--	--	--	--	--	--	--	--	1.1 B	1.0U	--	--	--	--	--	--	1.0U	1.0U	1.0U	1.0U
Round III		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.7U	0.7U
Round IV		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chromium, ug/L	100																				
Round I		3.0U	--	7.1U	--	269	--	6.0U	--	34.5	--	12.5	--	22.4	--	18.1	--	12.7	--	14.5/216	--
Round II		--	--	--	--	--	--	--	--	42.6	12.6	--	--	--	--	--	--	10U	10U	13	10U
Round III		--	--	--	--	4.6U	4.6U	--	--	--	--	--	--	--	--	--	--	--	--	10.3	7.4B
Round IV		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lead, ug/L	15																				
Round I		6.1	--	61	--	13	--	1.0U	--	20	--	9.3	--	6.1	--	1.0U	--	6.8	--	1.0U/10.4	--
Round II		--	--	--	--	--	--	--	--	31.8N	5.4W	--	--	--	--	--	--	5.3U	2.0U	2.0U	2.0U
Round III		--	--	3.7	0.6U	--	--	--	--	0.9B	0.6U	--	--	--	--	--	--	--	--	0.9B	0.6U
Round IV		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Carbon Disulfide, ug/L	56																				
Round I		15	NA	10U	NA	10U	NA	3J	NA	0.9	NA	0.8	NA	10U	NA	47	NA	10U	NA	2J	NA

Notes: PCL - Potential Clean up Level
 NF - Sample was not filtered prior to analysis
 F - Sample was filtered prior to analysis
 -- - No sample was collected
 U - Analyte was not present in detectable concentrations.
 J - Indicates an estimated value
 N - Indicates an estimated value because spike sample recovery was not within control limits
 B - Indicates an estimated value which is less than the CRDL but greater than the IDL.
 * - Well DRW-11 was sampled twice during Round I
 W - Not Applicable
 NA - Not Applicable

Round I - August - October 1991
 Round II - December 1991
 Round III - June 1992
 Round IV - December 1992

Entered by: TWS 4/19/94, JAM 4/5/95
 Checked by: JAM 5/12/94, MLP 4/13/95

Source: Remedial Investigation Report, June 1992
 Addendum to Remedial Investigation Report, June 1992
 Impact of Phase II, III, and IV Remedial Investigation Data on the Baseline Risk Assessment, January 1993
 Feasibility Study, December 1992
 Former Firestone Tire and Rubber Company Facility
 Albany, Georgia, Woodward Clyde Consultants

Table 4.1. Range of Concentrations of Inorganics of Interest in Background Soil Samples

Inorganic of Interest	Firestone Tire & Rubber Company Site			MGP Site	USGS
	Surface Soils	Subsurface Soils	Sediment	Soils	Background Study
Antimony, mg/Kg	ND	ND to 3.8	ND to 20.7	0.3 to 0.4	1
Beryllium, mg/Kg	ND to 0.45	ND to 6.2	ND	NA	1.5
Chromium, mg/Kg	ND to 21.5	12.4 to 24.1	3.4 to 18.8	55 to 70	100
Lead, mg/Kg	ND to 26.5	4.9 to 34	9.2 to 12.5	19 to 22	20

Notes:

ND - Not detected (detection limits are provided in the RI Report)

NA - Not Analyzed

Entered by: AC 10/2/95

Checked by: JAM 10/2/95

Sources: *Remedial Investigation Report*, Firestone Tire and Rubber Company Facility, Albany, Georgia
Woodward-Clyde Consultants, June 1992

*A Preliminary Investigation of the Hydrogeology and Contamination in the Area of an Abandoned
Manufactured Gas Plant in Albany, Georgia*. USGS, Water Resources Investigaion
Report 90-4141, Doraville, Georgia 1990

Chemical Analysis of Soils and Other Surficial Materials of the Conterminous United States
USGS, Open File Report 81-197, 1981

Table 5.1. Ground-Water Elevations

Well Number	Surface Elevation ¹ (feet, msl)	Top of Casing Elevation ¹ (feet, msl)	Static Ground-Water Level March 28, 1995 (feet, bgs)	Ground-Water Elevation March 28, 1995 (feet, msl)	Static Ground-Water Level May 22, 1995 (feet, bgs)	Ground-Water Elevation May 22, 1995 (feet, msl)
<u>Residuum/Transition Zone</u>						
BMW-2A	210.6	213.4	7.6	205.8	8.9	204.5
BMW-3	214.0	215.9	22.2	193.7	29.5	186.5
BMW-4	217.1	219.4	25.3	194.1	29.0	190.4
EMG-1	213.1	215.3	44.6	170.7	46.1	169.3
EMG-2	216.5	218.7	43.3	175.4	47.2	171.5
EMG-6	205.1	207.8	33.7	174.1	37.5	170.3
EMG-7	202.8	205.4	35.0	170.4	33.9	171.5
MW-1-1	213.4	216.0	44.5	171.5	49.9	166.1
MW-1-2	214.16	213.69	17.7	196.0	16.8	196.9
MW-1-3	212.1	214.2	63.9	150.4	43.1	171.2
MW-1-4	212.6	214.1	19.8	194.3	22.6	191.5
MW-1-5A	212.2	212.1	41.6	170.5	46.4	165.7
MW-1-6A	214.5	214.4	42.6	171.9	48.7	165.7
MW-7-4	214.8	217.7	43.3	174.4	DRY	--
MW-7-5	212.9	214.6	41.7	172.9	47.1	167.5
MW-7-8	212.6	214.1	22.9	191.2	25.6	188.5
MW-12-1	206.3	208.9	10.9	198.0	20.9	188.0
MW-12-1B	207.5	209.5	11.7	197.8	23.3	186.2
MW-14	214.6	214.3	39.2	175.1	43.3	171.0
PTW-1	212.5	214.6	55.7	158.9	44.5	170.1
RW-1	213.5	215.2	42.5	172.7	49.9	165.3
RW-2	214.1	215.2	45.0	170.2	51.3	163.9
RW-3	214.5	216.6	45.4	171.2	49.8	166.8
<u>Upper Ocala Wells</u>						
DRW-1	214.4	215.9	44.8	171.1	50.7	165.2
DRW-2	214.3	216.4	46.5	169.9	52.4	164.0
DRW-3	214.3	216.0	46.6	169.4	52.6	163.4
DRW-4	214.4	216.5	46.6	169.9	52.8	163.7
DRW-8	214.6	214.4	44.0	170.4	50.0	164.4
EMG-3	213.3	215.7	41.6	174.1	47.8	167.9
EMG-5B	214.5	216.8	46.3	170.5	52.3	164.5
MW-13	214.6	214.4	43.8	170.6	49.8	164.6
RW-4	212.0	211.7	39.9	171.8	44.8	166.9
RW-5	213.3	215.3	44.3	171.0	46.9	168.5
RW-6	214.4	216.4	44.5	171.9	50.5	165.9
RW-7	214.5	214.0	41.2	172.8	47.0	167.0
RW-8	206.9	209.1	37.2	171.9	41.7	167.4
RW-9	204.6	206.6	36.5	170.1	36.1	170.5
RW-10A	215.0	214.8	40.5	174.3	45.4	169.5
<u>Lower Ocala Wells</u>						
DRW-5	212.3	212.0	42.9	169.2	49.0	163.0
DRW-6A	212.3	214.0	45.3	168.7	51.4	162.6
DRW-7A	206.5	208.7	40.6	168.0	46.5	162.2
DRW-9	214.6	214.3	44.9	169.3	51.0	163.2
DRW-10	204.1	206.1	39.0	167.1	44.8	161.4
DRW-11	214.6	214.4	45.4	169.1	51.4	163.0
OW-1	214.5	217.3	47.9	169.4	54.0	163.3
OW-2	216.5	217.3	49.2	168.1	55.0	162.3
<u>Surface Water Staff Gauges²</u>						
Staff Gauge #1	--	204.59	3.0	201.6	DRY	--
Staff Gauge #2	--	209.38	DRY	--	DRY	--
Staff Gauge #3	--	217.05	DRY	--	DRY	--

Notes:

msl - Mean Sea Level

bgs - Below Ground Surface

1. Remedial Investigation Report, Woodward-Clyde Consultants, 1992, was used as the source for the surveyed elevations. Elevations for BMW-2A, MW-1-2, MW-1-5A, MW-1-6A, RW-10A and the staff gauges were surveyed by Marbury Engineering in April 1995.

2. Staff gauge elevations were measured at the top of the gauge. In cases where the staff gauge was observed to be on dry land, standing water was observed in the defined wetlands areas.

Entered by: MLP 3/31/95, 10/2/95

Checked by: JAM 4/5/95, 10/2/95

Table 5.2: Summary of Ground-Water Quality Parameters¹

Well Number	Sampling Round	pH (std. units)	Specific Conductivity (mmhos/cm)	Temperature (° C)	Purge Water Turbidity (NTUs)	Sample Turbidity (NTUs)	Visual Clarity
<u>Residuum/Transition Zone Wells</u>							
BMW-2A	V	5.1	0.25	25.0	5.5	--	clear
	VI	5.18	0.24	28.1	1.7	8.75	clear
BMW-3	V	5.3	0.24	21.2	19.2	--	v. sl. cloudy
	VI	3.2	0.247	31.3	12.4	11.96	clear
BMW-4	V	5.3	0.23	20.8	9.8	--	clear
	VI	5.42	0.277	30.1	19.7	5.25	clear
EMG-2	V	7.7	0.38	20.6	1.1	--	clear
	VI	7.7	0.264	23.3	4.03	13.31	clear
EMG-6	V	7.6	0.56	20.8	1.5	--	clear
	VI	6.98	0.68	32.3	18.7	>200	clear
EMG-7	V	7.7	0.31	21.1	3.9	--	clear
	VI	7.56	0.724	25.5	4.9	10.1	v. sl. cloudy
MW-1-2	V	3.4	0.24	22.5	3.8	--	clear
	VI	5.42	0.135	29.1	4.9	4.61	clear
MW-1-3	V	5.7	0.35	24.7	2.1	--	clear
	VI	4.2	0.297	31.1	43.2	6.68	v. sl. cloudy
MW-1-4	V	4.1	1.90	23.3	23.1	--	v. sl. cloudy
	VI	5.8	1.116	34.3	81.6	5.9	sl. cloudy
MW-1-5A	V	8.0	0.41	23.3	1050	--	cloudy
	VI	7.32	0.427	25.2	14.2	41	clear
MW-1-6A	V	7.5	0.29	23.3	43	--	cloudy
	VI	7.7	0.299	26.6	188	182.2	cloudy
MW-7-5	V	7.2	0.37	25.5	*	--	sl. cloudy
	VI	7.04	0.391	22.6	>200	156.2	cloudy
MW-7-8	V	4.9	0.30	23.5	1.3	--	clear
	VI	4.9	0.182	25.9	3.5	9.96	v. sl. cloudy
MW-14	V	6.6	*	22.2	*	--	clear
	VI	4.9	0.544	32.2	125	27.2	cloudy
RW-3	V	7.5	*	21.7	*	--	clear
	VI	7.35	0.41	30.3	39.9	57.8	sl. cloudy
<u>Upper Ocala Wells</u>							
EMG-5	V	7.5	0.40	23.4	3.2	--	clear
	VI	7.43	0.439	28.1	7.1	21.6	clear
RW-10A	V	12.1	2.44	23.0	*	--	clear
	VI	10.55	1.84	35.4	31.9	14.31	v. sl. cloudy
<u>Lower Ocala Wells</u>							
DRW-5	V	6.3	0.38	25.4	0.3	--	clear
	VI	8.46	0.241	23.6	1.2	--	clear
DRW-11	V	9.3	2.53	24.9	*	--	clear
	VI	8.99	0.182	24.6	2.78	--	clear
OW-2	V	7.4	0.41	24.3	3.4	--	clear
	VI	7.3	0.294	21.7	10	17.68	clear
PW-1	V	7.5	0.27	20.6	1.1	--	clear
	VI	6.87	0.265	24.2	1.12	1.12	clear

Notes:

1. Water quality parameters measured at the completion of purging.

* Meter was not functioning during purging of this well

Round V - February/March 1995

Round VI - May 1995

Prepared by/Date: MLP 4/17/95, AC 10/2/95

Checked by/Date: JAM 5/2/95, 10/3/95

Table 5.3: Summary of Analytical Results for Round V Sampling

Sample Location	Sample Date	CS ₂ ug/L	Antimony, ug/L		Beryllium, ug/L		Chromium, ug/L		Lead, ug/L		
			Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered	Filtered	
Residuum/Transition Zone											
BMW-2A (bkgd)	03/15/95	2 J	1.9 U	1.9 U	0.2 U	0.2 U	1 B	0.5 U	1 B	0.9 U	
BMW-3	03/02/95	NA	1.9 U	1.9 U	0.2 U	0.2 U	4.8 BP	1.1 BP	3.3 P	0.9 U	
BMW-4	02/28/95	10 U	NA	NA	NA	NA	NA	NA	NA	NA	
EMG-2	03/02/95	NA	1.9 U	1.9 U	0.2 U	0.2 U	1.9 BP	1.5 BP	2.2 BP	0.9 U	
EMG-5A	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
EMG-6	03/01/95	NA	1.9 U	1.9 U	0.2 U	0.2 U	2.4 BP	0.71 BP	2.3 BP	2 BP	
EMG-7	03/01/95	36	1.9 U	1.9 U	0.2 U	0.2 U	1.7 BP	0.5 U	0.94 BP	0.9 U	
MW-1-2	03/03/95	NA	1.9 U	1.9 U	0.2 U	0.2 U	0.96 BP	0.5 U	3.9 P	3 BP	
MW-1-3	03/03/95	NA	1.9 U	1.9 U	0.2 U	0.2 U	1.6 BP	0.76 BP	2.6 BP	2 BP	
MW-1-4	03/02/95	NA	1.9 U	1.9 U	0.43 B	0.58 B	2.6 BP	1 BP	5.1 P	5.5 P	
MW-1-5A	03/15/95	NA	2.8 B	1.9 U	0.32 B	0.2 U	2.3 B	1.6 B	2.2 B	0.9 U	
MW-1-6A	03/15/95	NA	1.9 U	1.9 U	0.2 U	0.2 U	3.3 B	2.5 B	0.9 U	0.9 U	
MW-7-5	02/28/95	NA	1.9 U	1.9 U	0.2 U	0.2 U	1.5 B	1.1 B	0.9 U	0.9 U	
MW-7-5D	02/28/95	NA	1.9 U	1.9 U	0.28 B	0.2 U	1.5 B	1.2 B	0.9 U	0.9 U	
MW-7-8	02/28/95	10 U	NA	NA	NA	NA	NA	NA	NA	NA	
MW-14	02/27/95	NA	2.7 B	1.9 U	0.2 U	0.2 U	3.6 B	0.78 B	1.1 B	0.9 U	
RW-3	02/26/95	NA	1.9 U	2 B	0.2 U	0.2 U	4.1 B	1.3 B	0.9 U	0.9 U	
Upper Ocala											
EMG-5	03/02/95	NA	1.9 U	1.9 U	0.2 U	0.2 U	1.7 BP	1.3 BP	1.2 BP	0.9 U	
RW-10A (bkgd)	02/28/95	10 U	2.2 B	1.9 U	0.2 U	0.2 U	22.6	23.9	5.9	4.9	
Lower Ocala											
OW-2	02/28/95	NA	1.9 U	2.8 B	0.2 U	0.2 U	0.5 U	0.5 U	1.1 B	0.9 U	
PW-1	03/01/95	NA	1.9 U	1.9 U	0.2 U	0.2 U	1.8 BP	1.8 BP	0.9 U	0.9 U	
DRW-5	03/02/95	NA	1.9 U	1.9 U	0.2 U	0.2 U	17.6 P	14.9 P	1.7 BP	0.9 U	
DRW-11 (bkgd)	02/27/95	10 U	2.0 B	1.9 U	0.2 U	0.2 U	9.9 B	7.8 B	0.9 U	0.9 U	
DRW-11D	02/27/95	10 U	1.9 U	1.9 U	0.2 U	0.2 U	10.6	7.7 B	0.9 U	0.9 U	
OC Samples											
FB-0227A	02/27/95	1.3 J	1.9 U	NA	0.2 U	NA	0.5 U	NA	0.9 U	NA	
FB-0228A	02/28/95	10 U	NA	NA	NA	NA	NA	NA	NA	NA	
FB-0228B	02/28/95	10 U	1.9 U	NA	0.2 U	NA	0.5 U	NA	2.2 B	NA	
FB-0228C	02/28/95	10 U	NA	NA	NA	NA	NA	NA	NA	NA	
FB-0228D	02/28/95	10 U	NA	NA	NA	NA	NA	NA	NA	NA	
FB-0228E	02/28/95	10 U	NA	NA	NA	NA	NA	NA	NA	NA	
FB-0301	03/01/95	10 U	NA	NA	NA	NA	NA	NA	NA	NA	
FB-0314	03/14/95	10 U	NA	NA	NA	NA	NA	NA	NA	NA	
RB-0302	03/02/95	10 U	1.9 U	1.9 U	0.2 U	0.2 U	0.5 U	0.5 U	0.9 U	0.9 U	
TB-0228	02/28/95	10 U	NA	NA	NA	NA	NA	NA	NA	NA	
TB-0303	03/03/95	10 U	NA	NA	NA	NA	NA	NA	NA	NA	
TB-0314	03/14/95	10 U	NA	NA	NA	NA	NA	NA	NA	NA	
MW-9-3 (EPA Spike)		10 U	NA	NA	NA	NA	NA	NA	NA	NA	
MW-9-4 (EPA Spike)		10 U	NA	NA	NA	NA	NA	NA	NA	NA	

Prepared by/Date: JAM 4/12/95

Checked by/Date: MLP 4/13/95

Notes:

- U - Analyte was not detected above reported Sample Detection Limit (inorganics) or Contract Required Quantitation Limit (CS&d2)
- J - Analyte was detected below the Contract Required Quantitation Limit
- B - Analyte was detected below the Contract Required Detection Limit
- P - Analyte was detected in the Preparation Blank
- NA - Sample was not analyzed for this parameter

Table 5.4: Summary of Analytical Results for Round VI Sampling

Sample Location	Sample Date	CS ₂ ug/L	Antimony, ug/L		Beryllium, ug/L		Chromium, ug/L		Lead, ug/L	
			Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered	Filtered
Residuum/Transition Zone										
BMW-2A (bkgd)	5/24/95*	10 U	2.4 U	2.4 U	0.3 BP	0.4 BP	0.5 U	0.5 U	0.8 B	0.7 U
BMW-2AD	5/24/95	NA	2.4 U	2.4 U	0.3 BP	0.4 BP	0.5 U	0.5 U	0.7 U	0.7 U
BMW-3	5/25/95	NA	2.4 U	2.4 U	0.6 BP	1.8 BP	4.3 BP	2.3 BP	0.7 U	0.7 U
BMW-4	5/24/95	1 J	NA	NA	NA	NA	NA	NA	NA	NA
EMG-2	5/24/95	NA	2.4 U	2.4 U	0.1 U	0.7 BP	2.3 BP	1.3 BP	1.0 BP	0.7 U
EMG-6	5/24/95	NA	2.4 U	2.4 U	0.2 BP	0.7 BP	1.7 BP	0.5 U	0.7 U	0.7 U
EMG-6D	5/24/95	NA	2.4 U	2.4 U	0.3 BP	0.8 BP	1.9 BP	0.5 U	0.7 U	0.7 U
EMG-7	5/24/95	10 U	2.4 U	2.4 U	0.1 BP	0.8 BP	2.1 BP	0.5 BP	0.7 U	0.7 U
MW-1-2	5/25/95	NA	2.4 U	2.4 U	0.7 BP	1.7 BP	0.8 BP	0.5 U	0.7 U	0.7 U
MW-1-3	5/25/95	NA	2.4 U	2.4 U	0.6 BP	1.7 BP	17.8 P	0.7 BP	3.2 P	0.7 U
MW-1-4	5/24/95	NA	2.4 U	2.4 U	0.9 BP	1.7 BP	3.3 BP	2.9 BP	0.7 U	0.7 U
MW-1-5A	5/25/95	NA	2.4 U	2.4 U	0.2 BP	0.7 BP	5.4 BP	2.2 BP	0.7 U	0.7 U
MW-1-6A	5/25/95	NA	2.4 U	2.4 U	0.2 BP	0.8 BP	2.0 BP	0.9 BP	0.7 U	0.7 U
MW-7-5	5/25/95	NA	2.4 U	2.4 U	0.7 BP	1.7 BP	1.6 BP	1.5 BP	0.7 U	0.7 U
MW-7-8	5/23/95	10 U	NA	NA	NA	NA	NA	NA	NA	NA
MW-14	5/25/95	NA	2.4 U	2.4 U	0.1 BP	0.7 BP	2.5 BP	0.5 BP	0.7 U	0.7 U
RW-3	5/25/95	NA	2.4 U	2.4 U	0.7 BP	1.6 BP	5.8 BP	4.6 BP	0.7 U	0.7 U
Upper Ocala										
EMG-5	5/25/95	NA	2.4 U	2.4 U	0.7 BP	1.7 BP	1.2 BP	1.3 BP	0.7 U	0.7 U
RW-10A (bkgd)	5/24/95*	1 J	2.4 U	2.4 U	0.3 BP	1.1 BP	8.5 BP	6.8 BP	5.5 P	0.7 U
RW-10AD	5/23/95	1 J	NA	NA	NA	NA	NA	NA	NA	NA
Lower Ocala										
OW-2	5/23/95	NA	2.4 U	2.4 U	0.2 BP	0.3 BP	0.5 U	0.5 U	1.5 B	0.7 U
PW-1	5/23/95	NA	2.4 U	2.4 U	0.2 BP	0.3 BP	1.6 BP	3.6 BP	0.7 U	0.7 U
DRW-5	5/23/95	NA	2.4 U	2.4 U	0.3 BP	0.3 BP	12.7 P	11.3 P	0.8 B	0.7 U
DRW-11 (bkgd)	5/22/95	10 U	2.4 U	2.4 U	0.2 BP	0.9 BP	8.2 BP	7.4 BP	0.7 U	0.7 U
OC Samples										
FB-0522	5/22/95	10 U	NA	NA	NA	NA	NA	NA	NA	NA
FB-0523A	5/23/95	10 U	NA	NA	NA	NA	NA	NA	NA	NA
FB-0523B	5/23/95	10 U	NA	NA	NA	NA	NA	NA	NA	NA
FB-0523C	5/23/95	10 U	NA	NA	NA	NA	NA	NA	NA	NA
FB-0524A	5/24/95	NA	2.4 U	NA	0.3 BP	NA	0.5 U	NA	0.7 U	NA
FB-0524B	5/24/95	10 U	NA	NA	NA	NA	NA	NA	NA	NA
FB-0524C	5/24/95	10 U	NA	NA	NA	NA	NA	NA	NA	NA
RB-0525	5/25/95	10 U	2.4 U	2.4 U	0.9 BP	1.9 BP	1.5 BP	1.1 BP	0.7 U	0.7 U
TB-0524	5/24/95	10 U	NA	NA	NA	NA	NA	NA	NA	NA
TB-0525	5/25/95	10 U	NA	NA	NA	NA	NA	NA	NA	NA

Prepared by/Date: JAM 6/13/95

Checked by/Date: JRM 6/13/95

Notes:

- U - Analyte was not detected above reported Sample Detection Limit (inorganics) or Contract Required Quantitation Limit (CS₂)
- J - Analyte was detected below the Contract Required Quantitation Limit
- B - Analyte was detected below the Contract Required Detection Limit
- P - Analyte was detected in the Preparation Blank
- * - Volatile sample was collected of previous day
- NA - Sample was not analyzed for this parameter

Table 6.1: Analytical Results for the Constituents of Interest: Residuum and Transition Zone Wells

	PCL	BMW-2/ BMW-2A*		BMW-3		BMW-4		EMG-1		EMG-2		EMG-5A**		EMG-6		EMG-7	
		NF	F	NF	F	NF	F	NF	F	NF	F	NF	F	NF	F	NF	F
Antimony, ug/L	6																
Round I		82.3	--	15.7U	--	11.6U	--	17.6U	--	22.4U	--	11.5U	--	64.1	--	9.0U	--
Round II		9.8B	12.1B	--	--	--	--	--	--	--	--	--	--	--	--	54.7B	22.2B
Round III		17.4U	17.4U	--	--	--	--	--	--	--	--	--	--	17.4U	17.4U	17.4U	17.4U
Round IV		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Round V		1.9U	1.9U	1.9U	1.9U	--	--	--	--	1.9U	1.9U	NA	NA	1.9U	1.9U	1.9U	1.9U
Round VI		2.4U	2.4U	2.4U	2.4U	--	--	--	--	2.4U	2.4U	NA	NA	2.4U	2.4U	2.4U	2.4U
Beryllium, ug/L	4																
Round I		4.8B	--	2.1B	--	1.2B	--	2.5B	--	1.5B	--	6.5	--	10.7	--	1.0U	--
Round II		1.0U	1.0U	--	--	--	--	--	--	--	--	--	--	--	--	1.7B	3.5B
Round III		0.7U	0.7U	--	--	--	--	--	--	--	--	2.4B	0.7U	27	0.7U	--	--
Round IV		--	--	--	--	--	--	--	--	--	--	--	--	4	2.0U	--	--
Round V		0.2U	0.2U	0.2U	0.2U	--	--	--	--	0.2U	0.2U	NA	NA	0.2U	0.2U	0.2U	0.2U
Round VI		0.3BP	0.4BP	0.6BP	1.8BP	--	--	--	--	0.1U	0.7BP	NA	NA	0.2BP	0.7BP	0.1BP	0.8BP
Chromium, ug/L	100																
Round I		143	--	33.7	--	13.6	--	9.8B	--	6.4B	--	39.5	--	69.6	--	3.0U	--
Round II		6.0U	6.0U	--	--	--	--	--	--	--	--	--	--	--	--	40.3J	11.8J
Round III		4.6U	4.6U	--	--	--	--	--	--	--	--	--	--	51.5	4.6U	--	--
Round IV		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Round V		1.0B	0.5U	4.8BP	1.1BP	--	--	--	--	1.9BP	1.5BP	NA	NA	2.4BP	0.71BP	1.7BP	0.5U
Round VI		0.5U	0.5U	4.3BP	2.3BP	--	--	--	--	2.3BP	1.3BP	NA	NA	1.7BP	0.5U	2.1BP	0.5BP
Lead, ug/L	15																
Round I		56.7	--	25.8	--	6.6	--	7.1	--	25.4	--	18.2	--	10.5	--	3.9	--
Round II		2.3B	1.0U	--	--	--	--	--	--	--	--	--	--	--	--	11.3S	1.0U
Round III		2.5B	0.6U	1.2B	0.6U	--	--	--	--	7.3	0.6U	8.4	1.0B	--	--	--	--
Round IV		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Round V		1.0B	0.9U	3.3P	0.9U	--	--	--	--	2.2BP	0.9U	NA	NA	2.3BP	2BP	0.94BP	0.9U
Round VI		0.8B	0.7U	0.7U	0.7U	--	--	--	--	1.0B	0.7U	NA	NA	0.7U	0.7U	0.7U	0.7U
Carbon Disulfide, ug/L	56																
Round I		54	NA	23	NA	260	NA	5U	NA	5U	NA	10	NA	10	NA	130	NA
Round V		2J	NA	--	NA	10U	NA	--	NA	--	NA	NA	NA	--	NA	36	NA
Round VI		10U	NA	--	NA	1J	NA	--	NA	--	NA	NA	NA	--	NA	10U	NA

Notes: PCL Potential Clean up Level

NF Sample was not filtered prior to analysis.

-- No sample was collected

B Indicates an estimated value which is less than the CRDL but greater than the IDL.

P Analyte was detected in the Preparation Blank (Rounds V and VI only)

F Sample was filtered prior to analysis

J Indicates an estimated value

S Indicates a reported value determined by Method of Standard Addition.

U Analyte was not detected at the reported detection limit.

* Monitoring well BMW-2 was replaced on March 8, 1995

** Monitoring well EMG-5A was abandoned on March 9, 1995 due to absence of sufficient water.

NA Not Applicable

Round I - August - October 1991

Round II - December 1991

Round III - June 1992

Round IV - December 1992

Round V - February/March 1995

Round VI - May 1995

Table 6.1: Analytical Results for the Constituents of Interest: Residuom and Transition Zone Wells

	PCL	MW-1-1		MW-1-2		MW-1-3		MW-1-4		MW-1-5/ MW-1-5A*		MW-1-6/ MW-1-6A**		MW-7-5		MW-7-8	
		NF	F	NF	F	NF	F	NF	F	NF	F	NF	F	NF	F	NF	F
Antimony, ug/L	6																
Round I		28.4U	--	17.4U	--	21.6U	--	54.7U	--	27.8U	--	9.0U	--	119	--	24.2U	--
Round II		--	--	9.5B	7.0U	--	--	--	--	--	--	--	--	--	--	--	--
Round III		--	--	17.4U	17.4U	--	--	--	--	--	--	--	--	17.4U	17.4U	--	--
Round IV		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Round V		--	--	1.9U	1.9U	1.9U	1.9U	1.9U	1.9U	2.8B	1.9U	1.9U	1.9U	1.9U	1.9U	--	--
Round VI		--	--	2.4U	2.4U	2.4U	2.4U	2.4U	2.4U	2.4U	2.4U	2.4U	2.4U	2.4U	2.4U	--	--
Beryllium, ug/L	4																
Round I		1.7B	--	1.0U	--	3.6B	--	4.3B	--	13.2	--	8.1	--	45.7	--	1.0U	--
Round II		--	--	1.0U	1.0U	--	--	--	--	--	--	--	--	--	--	--	--
Round III		--	--	--	--	--	--	0.71B	1.2	2.3B	0.7U	0.7U	0.7U	2.3B	0.93B	--	--
Round IV		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Round V		--	--	0.2U	0.2U	0.2U	0.2U	0.43B	0.58B	0.32B	0.2U	0.2U	0.2U	0.28B	0.2U	--	--
Round VI		--	--	0.7BP	1.7BP	0.6BP	1.7BP	0.9BP	1.7BP	0.2BP	0.7BP	0.2BP	0.8BP	0.7BP	1.7BP	--	--
Chromium, ug/L	100																
Round I		53.9	--	14.1U	--	184	--	72.9	--	72.4	--	160	--	157	--	31.8U	--
Round II		--	--	6.0U	6.0U	--	--	--	--	--	--	--	--	--	--	--	--
Round III		5.9B	4.6U	--	--	5.1B	4.6U	30	4.6U	8.1B	4.6U	5.5B	4.6U	11.1	5.7B	--	--
Round IV		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Round V		--	--	0.96BP	0.5U	1.6BP	0.76BP	2.6BP	1.0BP	2.3B	1.6B	3.3B	2.5B	1.5B	1.2B	--	--
Round VI		--	--	0.8BP	0.5U	17.8	0.7BP	3.3BP	2.9BP	5.4BP	2.2BP	2.0BP	0.9BP	1.6BP	1.5BP	--	--
Lead, ug/L	15																
Round I		14.1	--	4.7U	--	92.2S	--	37.7	--	82.4S	--	91.6	--	114	--	8.2U	--
Round II		--	--	7.2	1.0U	--	--	--	--	--	--	--	--	--	--	--	--
Round III		--	--	--	--	2.6B	0.6B	18.8	1.4B	11.7	0.6U	12.3	0.6U	11.9	0.6U	--	--
Round IV		--	--	--	--	--	--	7.0	2.0	--	--	--	--	--	--	--	--
Round V		--	--	3.9P	3BP	2.6BP	2BP	5.1P	5.5P	2.2B	0.9U	0.9U	0.9U	0.9U	0.9U	--	--
Round VI		--	--	0.7U	0.7U	3.2P	0.7U	0.7U	0.7U	0.7U	0.7U	0.7U	0.7U	0.7U	0.7U	--	--
Carbon Disulfide, ug/L	56																
Round I		21	NA	5U	NA	5U	NA	--	NA	3J	NA	5U	NA	10	NA	77	NA
Round V		--	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	NA	10U	NA
Round VI		--	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	NA	10U	NA

Notes: PCL - Potential Clean-up Level

NF - Sample was not filtered prior to analysis

-- - No sample was collected

B - Indicates an estimated value which is less than the CRDL, but greater than the HDL

P - Analyte was detected in the Preparation Blank (Rounds V and VI only)

F - Sample was filtered prior to analysis

J - Indicates an estimated value

S - Indicates a reported value determined by Method of Standard Addition

U - Analyte was not detected at the reported detection limit

* - Monitoring well MW-1-5 was replaced on March 8, 1995

** - Monitoring well MW-1-6 was replaced on March 8, 1995

NA - Not Applicable

Round I - August - October 1991

Round II - December 1991

Round III - June 1992

Round IV - December 1992

Round V - February/March 1995

Round VI - May 1995

Table 6.1: Analytical Results for the Constituents of Interest: Residuum and Transition Zone Wells

	PCL	MW-12-1*		MW-12-1B		MW-14		PTW-1		RW-1		RW-2		RW-3	
		NF	F	NF	F	NF	F	NF	F	NF	F	NF	F	NF	F
Antimony, ug/L	6														
Round I		19.5U/13.3	--	22.4U	--	74.6	--	9.0U	--	32.1U	--	--	--	20.1U	--
Round II		--	--	--	--	--	--	--	--	--	--	9.0U	7.0U	--	--
Round III		--	--	--	--	17.4U	17.4U	--	--	--	--	17.4U	17.4U	--	--
Round IV		--	--	--	--	--	--	--	--	--	--	--	--	--	--
Round V		--	--	--	--	2.7B	1.9U	--	--	--	--	--	--	1.9U	2.0B
Round VI		--	--	--	--	2.4U	2.4U	--	--	--	--	--	--	2.4U	2.4U
Beryllium, ug/L	4														
Round I		1.0U/1.0U	--	2.0B	--	1.0U	--	1.0U	--	1.0U	--	--	--	4.5B	--
Round II		--	--	--	--	--	--	--	--	--	--	1.0U	1.0U	--	--
Round III		--	--	--	--	--	--	--	--	--	--	--	--	--	--
Round IV		--	--	--	--	--	--	--	--	--	--	--	--	--	--
Round V		--	--	--	--	0.2U	0.2U	--	--	--	--	--	--	0.2U	0.2U
Round VI		--	--	--	--	0.1BP	0.7BP	--	--	--	--	--	--	0.7BP	1.6BP
Chromium, ug/L	100														
Round I		15U/15U	--	25.6	--	64.4	--	3.0U	--	22.0U	--	--	--	13.5	--
Round II		--	--	--	--	--	--	--	--	--	--	8.9B	6.0U	--	--
Round III		--	--	--	--	4.6U	4.6U	--	--	--	--	--	--	--	--
Round IV		--	--	--	--	--	--	--	--	--	--	--	--	--	--
Round V		--	--	--	--	3.6B	0.78B	--	--	--	--	--	--	4.1B	1.3B
Round VI		--	--	--	--	2.5BP	0.5U	--	--	--	--	--	--	5.8BP	4.6BP
Lead, ug/L	15														
Round I		4.8U/4.8U	--	7.5	--	15.9	--	3.1S	--	1.6U	--	--	--	9.2	--
Round II		--	--	--	--	--	--	--	--	--	--	1.5J	1.0U	--	--
Round III		--	--	--	--	2.1B	0.8B	--	--	--	--	--	--	1.9B	0.6U
Round IV		--	--	--	--	--	--	--	--	--	--	--	--	--	--
Round V		--	--	--	--	1.1B	0.9U	--	--	--	--	--	--	0.9U	0.9U
Round VI		--	--	--	--	0.7U	0.7U	--	--	--	--	--	--	0.7U	0.7U
Carbon Disulfide, ug/L	56														
Round I		18/4J	NA	4J	NA	5U	NA	5U	NA	14	NA	5U	NA	10	NA
Round V		--	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	NA
Round VI		--	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	NA

Notes: PCL - Potential Clean up Level

NF - Sample was not filtered prior to analysis.

-- - No sample was collected

B - Indicates an estimated value which is less than the CRDL, but greater than the HDL.

F - Sample was filtered prior to analysis

J - Indicates an estimated value

S - Indicates a reported value determined by Method of Standard Addition.

U - Analyte was not detected at the reported detection limit.

* - Well MW-12-1 was sampled twice during Round I.

NA - Not Applicable

P - Analyte was detected in the Preparation Blank (Rounds V and VI only)

Entered by: TWS 4/19/94, JAM 4/5/95, JAM 6/13/95

Checked by: JAM 5/11/94, MJP 4/13/95, JRM 6/13/95

Source: Remedial Investigation Report, June 1992
 Addendum to Remedial Investigation Report, June 1992
 Impact of Phase II, III and IV Remedial Investigation Data
 on the Baseline Risk Assessment, January 1993
 Feasibility Study, December 1992
 Former Firestone Tire and Rubber Company Facility
 Albany, Georgia

Table 6.2: Analytical Results for Constituents of Interest: Upper Ocala Wells

	PCL	EMG-3		EMG-5		MW-13		RW-4		RW-5		RW-6		RW-7	
		NF	F	NF	F	NF	F	NF	F	NF	F	NF	F	NF	F
Antimony, ug/L	6														
Round I		17.7U	--	16.4U	--	18.9U	--	7.0U	--	7.0U	--	15.2U	--	13.5U	--
Round II		--	--	--	--	--	--	7.0U	7.0U	--	--	--	--	--	--
Round III		--	--	--	--	--	--	--	--	--	--	--	--	--	--
Round IV		--	--	--	--	--	--	--	--	--	--	--	--	--	--
Round V		--	--	1.9U	1.9U	--	--	--	--	--	--	--	--	--	--
Round VI		--	--	2.4U	2.4U	--	--	--	--	--	--	--	--	--	--
Beryllium, ug/L	4														
Round I		2.5B	--	5.2	--	1.0U	--	1.0U	--	1.0U	--	1.0U	--	1.0U	--
Round II		--	--	--	--	--	--	1.0U	1.0U	--	--	--	--	--	--
Round III		--	--	2.5B	0.7U	--	--	--	--	--	--	--	--	--	--
Round IV		--	--	--	--	--	--	--	--	--	--	--	--	--	--
Round V		--	--	0.2U	0.2U	--	--	--	--	--	--	--	--	--	--
Round VI		--	--	0.7BP	1.7BP	--	--	--	--	--	--	--	--	--	--
Chromium, ug/L	100														
Round I		10.3	--	28.5	--	10.2	--	16.1	--	9.3B	--	7.6B	--	13.1	--
Round II		--	--	--	--	--	--	17.1J	6.0U	--	--	--	--	--	--
Round III		--	--	--	--	--	--	--	--	--	--	--	--	--	--
Round IV		--	--	--	--	--	--	--	--	--	--	--	--	--	--
Round V		--	--	1.7BP	1.3BP	--	--	--	--	--	--	--	--	--	--
Round VI		--	--	1.2BP	1.3BP	--	--	--	--	--	--	--	--	--	--
Lead, ug/L	15														
Round I		7.5	--	12.5	--	1.3B	--	1.1B	--	1.0U	--	2.2B	--	3.8	--
Round II		--	--	--	--	--	--	1.1B	1.0U	--	--	--	--	--	--
Round III		--	--	--	--	--	--	--	--	--	--	--	--	--	--
Round IV		--	--	--	--	--	--	--	--	--	--	--	--	--	--
Round V		--	--	1.2BP	0.9U	--	--	--	--	--	--	--	--	--	--
Round VI		--	--	0.7U	0.7U	--	--	--	--	--	--	--	--	--	--
Carbon Disulfide, ug/L	56														
Round I		10U	NA	10	NA	10U	NA	2J	NA	0.8J	NA	5J	NA	2J	NA
Round V		--	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	NA
Round VI		--	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	NA

Notes: PCL - Potential Clean-up Level

NF - Sample was not filtered prior to analysis

F - Sample was filtered prior to analysis

-- - No sample was collected

U - Analyte was not present in detectable concentrations

J - Indicates an estimated value

B - Indicates an estimated value which is less than the CRDL, but greater than the MDL

P - Analyte was detected in Preparation Blank (Rounds V and VI only)

NA - Not Applicable

Round I - August - October 1991

Round II - December 1991

Round III - June 1992

Round IV - December 1992

Round V - February/March 1995

Round VI - May 1995

Table 6.2: Analytical Results for Constituents of Interest: Upper Ocala Wells

	PCL	RW-8		RW-9		RW-10A*		DRW-2		DRW-3		DRW-4		DRW-8	
		NF	F	NF	F	NF	F	NF	F	NF	F	NF	F	NF	F
Antimony, ug/L.	6														
Round I		7.0U	--	7.0U	--	63	--	9.0U	--	14.3U	--	9.0U	--	16.1U	--
Round II		--	--	7.0U	7.0U	26.9B	27.9B	--	--	--	--	--	--	--	--
Round III		--	--	--	--	17.4U	17.4U	--	--	--	--	--	--	--	--
Round IV		--	--	--	--	--	--	--	--	--	--	--	--	--	--
Round V		--	--	--	--	2.2B	1.9U	--	--	--	--	--	--	--	--
Round VI		--	--	--	--	2.4U	2.4U	--	--	--	--	--	--	--	--
Beryllium, ug/L.	4														
Round I		1.0U	--	1.0U	--	1.0U	--	1.0U	--	1.0U	--	1.0U	--	1.0U	--
Round II		--	--	1.0U	1.0U	1.0U	1.0U	--	--	--	--	--	--	--	--
Round III		--	--	--	--	1.2B	1.2B	--	--	--	--	--	--	--	--
Round IV		--	--	--	--	--	--	--	--	--	--	--	--	--	--
Round V		--	--	--	--	0.2U	0.2U	--	--	--	--	--	--	--	--
Round VI		--	--	--	--	0.3BP	1.1BP	--	--	--	--	--	--	--	--
Chromium, ug/L.	100														
Round I		28.6	--	13.2	--	105	--	4.3U	--	3.0U	--	3.0U	--	11.8	--
Round II		--	--	6.0U	6.0U	61.7J	50.8J	--	--	--	--	--	--	--	--
Round III		--	--	--	--	23.5	25.8	--	--	--	--	--	--	--	--
Round IV		--	--	--	--	--	--	--	--	--	--	--	--	--	--
Round V		--	--	--	--	22.6	23.9	--	--	--	--	--	--	--	--
Round VI		--	--	--	--	8.5BP	6.8BP	--	--	--	--	--	--	--	--
Lead, ug/L.	15														
Round I		2.7B	--	2.9B	--	8.9	--	2.1B	--	1.6B	--	3.3	--	4.6	--
Round II		--	--	1.0U	1.0U	2.6BS	1.0U	--	--	--	--	--	--	--	--
Round III		--	--	--	--	1.0B	0.6U	--	--	--	--	--	--	--	--
Round IV		--	--	--	--	--	--	--	--	--	--	--	--	--	--
Round V		--	--	--	--	5.9	4.9	--	--	--	--	--	--	--	--
Round VI		--	--	--	--	5.5P	0.7U	--	--	--	--	--	--	--	--
Carbon Disulfide, ug/L.	56														
Round I		10U	NA	10U	NA	10U	NA	10U	NA	42	NA	10U	NA	2BJ	NA
Round V		--	NA	--	NA	10U	NA	--	NA	--	NA	--	NA	--	NA
Round VI		--	NA	--	NA	1J	NA	--	NA	--	NA	--	NA	--	NA

Notes: PCL - Potential Clean-up Level

NF - Sample was not filtered prior to analysis

F - Sample was filtered prior to analysis

-- No sample was collected

U - Analyte was not present in detectable concentrations

S - Indicates a reported value determined by Method of Standard Addition

J - Indicates an estimated value

B - Indicates an estimated value which is less than the CRDL, but greater than the HDL

* - Monitoring well RW-10 was replaced with RW-10A on February 20, 1995

NA - Not Applicable

P - Analyte was detected in Preparation Blank (Rounds V and VI only)

Source

Entered by: TWS 4/19/94, JAM 4/5/95, JAM 6/13/95
 Checked by: JAM 5/11/94, MI P 4/13/95, JRM 6/13/95
 Remedial Investigation Report, June 1992
 Addendum to Remedial Investigation Report, June 1992
 Impact of Phase II, III, and IV Remedial Investigation
 Data on the Baseline Risk Assessment, January 1993
 Feasibility Study, December 1992

Round I - August - October 1991
 Round II - December 1991
 Round III - June 1992
 Round IV - December 1992
 Round V - February/March 1993
 Round VI - May 1995

Table 6.3: Analytical Results for Constituents of Interest: Lower Ocala Wells

	PCL	OW-1		OW-2		PW-1		PW-2		DRW-5		DRW-6A		DRW-7A		DRW-9		DRW-10		DRW-11*	
		NF	F	NF	F	NF	F	NF	F	NF	F	NF	F	NF	F	NF	F	NF	F	NF	F
Antimony, ug/L	6																				
Round I		9.0U	--	9.0U	--	26U	--	7.6U	--	7.0U	--	7.0U	--	7.0U	--	7.0U	--	8.9U	--	7.0U/7.0U	--
Round II		--	--	--	--	--	--	--	--	3.0U	3.0U	--	--	--	--	--	--	3.0U	3.0U	3.0U	6.8B
Round III		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	17.4U	17.4U
Round IV		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Round V		--	--	1.9U	2.8B	1.9U	1.9U	--	--	1.9U	1.9U	--	--	--	--	--	--	--	--	2B	1.9U
Round VI		--	--	2.4U	2.4U	2.4U	2.4U	--	--	2.4U	2.4U	--	--	--	--	--	--	--	--	2.4U	2.4U
Beryllium, ug/L	4																				
Round I		1.0U	--	1.0U	--	1.0U	--	1.0U	--	1.0U	--	1.0U	--	1.0U	--	1.0U	--	1.0U	--	1.0U/1.0U	--
Round II		--	--	--	--	--	--	--	--	1.1 B	1.0U	--	--	--	--	--	--	1.0U	1.0U	1.0U	1.0U
Round III		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.7U	0.7U
Round IV		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Round V		--	--	0.2U	0.2U	0.2U	0.2U	--	--	0.2U	0.2U	--	--	--	--	--	--	--	--	0.2U	0.2U
Round VI		--	--	0.2BP	0.3BP	0.2BP	0.3BP	--	--	0.3BP	0.3BP	--	--	--	--	--	--	--	--	0.2BP	0.9BP
Chromium, ug/L	100																				
Round I		3.0U	--	7.1U	--	269	--	6.0U	--	34.5	--	12.5	--	22.4	--	18.1	--	12.7	--	14.5/216	--
Round II		--	--	--	--	--	--	--	--	42.6	12.6	--	--	--	--	--	--	10U	10U	13	10U
Round III		--	--	--	--	4.6U	4.6U	--	--	--	--	--	--	--	--	--	--	--	--	10.3	7.4B
Round IV		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Round V		--	--	0.5U	0.5U	1.8BP	1.8BP	--	--	17.6P	14.9P	--	--	--	--	--	--	--	--	10.6	7.8B
Round VI		--	--	0.5U	0.5U	1.6BP	3.6BP	--	--	12.7	11.3	--	--	--	--	--	--	--	--	8.2BP	7.4BP
Lead, ug/L	15																				
Round I		6.1	--	6.1	--	13	--	1.0U	--	20	--	9.3	--	6.1	--	1.0U	--	6.8	--	1.0U/10.4	--
Round II		--	--	--	--	--	--	--	--	31.8N	5.4W	--	--	--	--	--	--	5.3U	2.0U	2.0U	2.0U
Round III		--	--	3.7	0.6U	--	--	--	--	0.9B	0.6U	--	--	--	--	--	--	--	--	0.9B	0.6U
Round IV		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Round V		--	--	1.1B	0.9U	0.9U	0.9U	--	--	1.7BP	0.9U	--	--	--	--	--	--	--	--	0.9U	0.9U
Round VI		--	--	1.5B	0.7U	0.7U	0.7U	--	--	0.8B	0.7U	--	--	--	--	--	--	--	--	0.7U	0.7U
Carbon Disulfide, ug/L	56																				
Round I		15	NA	10U	NA	10U	NA	3J	NA	0.9	NA	0.8	NA	10U	NA	47	NA	10U	NA	2J	NA
Round V		--	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	NA	10U	NA
Round VI		--	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	NA	10U	NA

Notes: PCL - Potential Clean up Level

NF - Sample was not filtered prior to analysis.

F - Sample was filtered prior to analysis.

P - Analyte was detected in Preparation Blank (Rounds V and VI only)

-- - No sample was collected

U - Analyte was not present in detectable concentrations.

J - Indicates an estimated value

N - Indicates an estimated value because spike sample recovery was not within control limits.

B - Indicates an estimated value which is less than the CRDL; but greater than the IDL.

* - Well DRW-11 was sampled twice during Round I.

W - Not Applicable

NA - Not Applicable

Entered by: TWS 4/19/94, JAM 4/5/95, JAM 6/13/95

Checked by: JAM 5/11/94, MLP 4/13/95, JRM 6/13/95

Source: Remedial Investigation Report, June 1992
 Addendum to Remedial Investigation Report, June 1992
 Impact of Phase II, III, and IV Remedial Investigation Data on
 the Baseline Risk Assessment, January 1993
 Feasibility Study, December 1992
 Former Firestone Tire and Rubber Company Facility
 Albany, Georgia

Round I - August - October 1991
 Round II - December 1991
 Round III - June 1992
 Round IV - December 1992
 Round V - February/March 1995
 Round VI - May 1995

Table 6.4: Range of Concentrations of Inorganics of Interest During Each Sampling Event

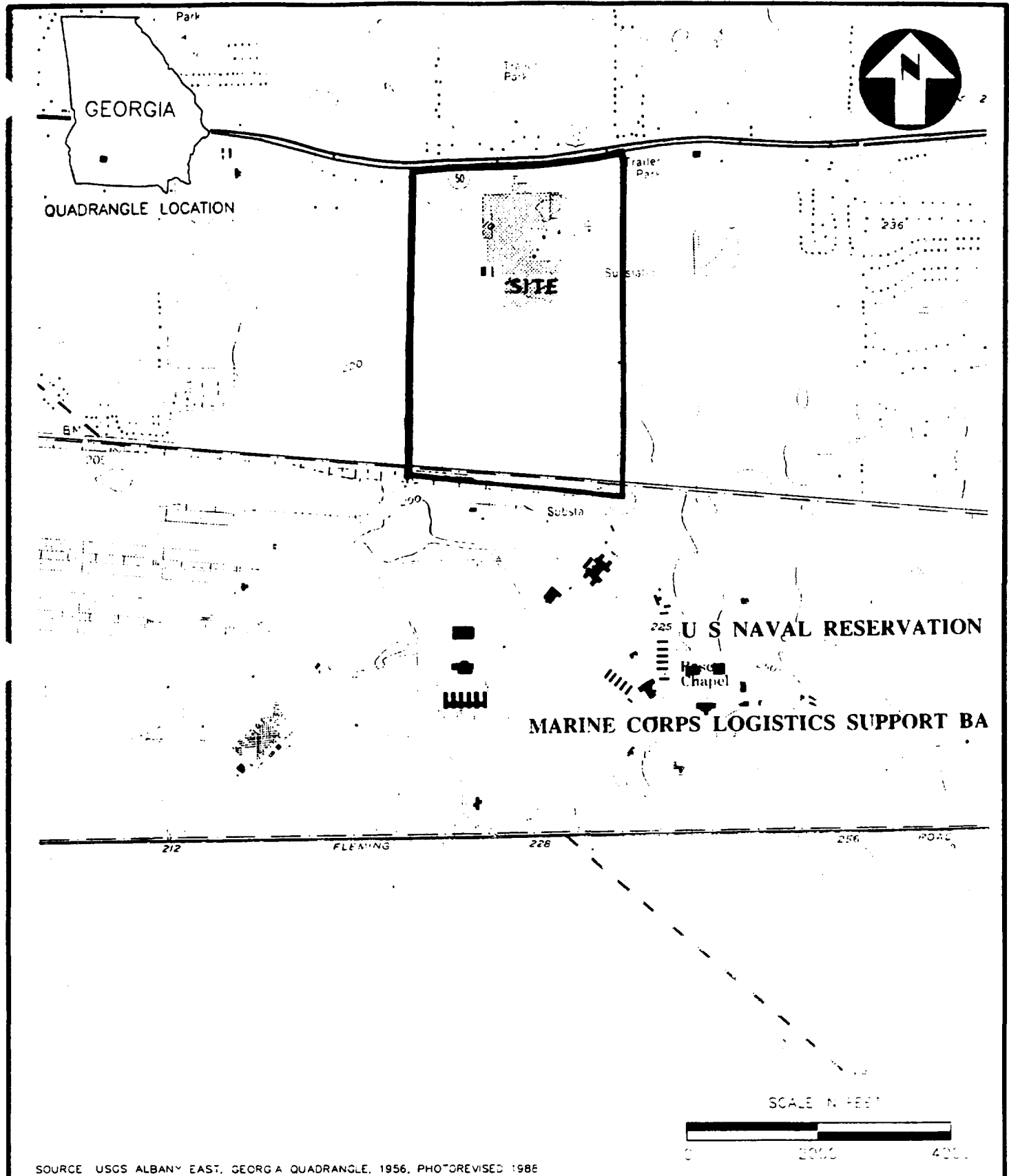
	PCL	RESIDUUM		UPPER OCALA		LOWER OCALA	
		NF	F	NF	F	NF	F
Antimony, ug/L	6						
Round I		9.0U-119	--	7.0U-63	--	7.0U-26U	--
Round II		9.0U-54.7B	7.0U-22.2B	7.0U-26.9B	7.0U-27.9B	3.0U	3.0U-6.8B
Round III		17.4U	17.4U	17.4U	17.4U	17.4U	17.4U
Round IV		--	--	--	--	--	--
Round V		1.9U-2.8B	1.9U-2.0B	1.9U-2.2B	1.9U	1.9U-2.0B	1.9U-2.8B
Round VI		2.4U	2.4U	2.4U	2.4U	2.4U	2.4U
Beryllium, ug/L	4						
Round I		1.0U-45.7	--	1.0U-5.2	--	1.0U	--
Round II		1.0U-1.7B	1.0U-3.5B	1.0U	1.0U	1.0U-1.1B	1.0U
Round III		0.7U-27	0.7U-1.2	1.2B-2.5B	0.7U-1.2B	0.7U	0.7U
Round IV		4	2.0U	--	--	--	--
Round V		0.2U-0.43B	0.2U-0.58B	0.2U	0.2U	0.2U	0.2U
Round VI		0.1U-0.9BP	0.4BP-1.7BP	0.3BP-0.7BP	1.1BP-1.7BP	0.2BP-0.3BP	0.3BP-0.9BP
Chromium, ug/L	100						
Round I		3.0U-184	--	3.0U-105	--	3.0U-269	--
Round II		6.0U-40.3J	6.0U-11.8J	6.0J-61.7J	6.0U-50.8J	10U-42.6	10U-12.6
Round III		4.6U-51.5	4.6U-5.7B	23.5	25.8	4.6U-10.3	4.6U-7.4B
Round IV		--	--	--	--	--	--
Round V		0.96BP-4.8B	0.5U-2.5B	1.7BP-22.6	1.3BP-23.9	0.5U-17.6P	0.5U-14.9P
Round VI		0.5U-17.8	0.5U-4.6BP	1.2BP-8.5BP	1.3BP-6.8BP	0.5U-12.7	0.5U-11.3
Lead, ug/L	15						
Round I		1.6U-114	--	1.0U-12.5	--	1.0U-61	--
Round II		1.5J-11.3S	1.0U	1.0U-2.6BS	1.0U	2.0U-31.8N	2.0U-5.4J
Round III		1.2B-18.8	0.6U-1.4B	1.0B	0.6U	0.9B-3.7	0.6U
Round IV		7.0	2.0	--	--	--	--
Round V		0.9U-5.1P	0.9U-5.5P	1.2BP-5.9	0.9U-4.9	0.9U-1.7BP	0.9U
Round VI		0.7U-3.2P	0.7U	0.7U-5.5P	0.7U	0.7U-1.5B	0.7U

Notes: PCL - Potential Clean-up Level
 NF - Sample was not filtered prior to analysis
 F - Sample was filtered prior to analysis
 -- - No sample was collected
 U - Analyte was not detected at the reported detection limit.
 B - Indicates an estimated value which is less than the CRDL, but greater than the IDL.
 S - Indicates a reported value determined by Method of Standard Addition.
 J - Indicates an estimated value
 N - Indicates an estimated value because spike sample recovery was not within control limits.
 P - Analyte was detected in the Preparation Blank (Rounds V and VI only)

Entered by: ANH 5/25/94, ARC 9/29/95
 Checked by: JAM 5/25/94, JAM 9/29/95

Source: Remedial Investigation Report, June 1992
 Addendum to Remedial Investigation Report, June 1992
 Impact of Phase II, III, and IV Remedial Investigation Data on the Baseline Risk Assessment, January 1993
 Feasibility Study, December 1992
 Former Firestone Tire and Rubber Company Facility
 Albany, Georgia

FIGURES



LEGEND

SITE LOCATION MAP

ATEC Associates, Inc.



of Georgia
1300 Williams Drive
Marietta, Georgia 30066
(404)427-9456

PROJECT

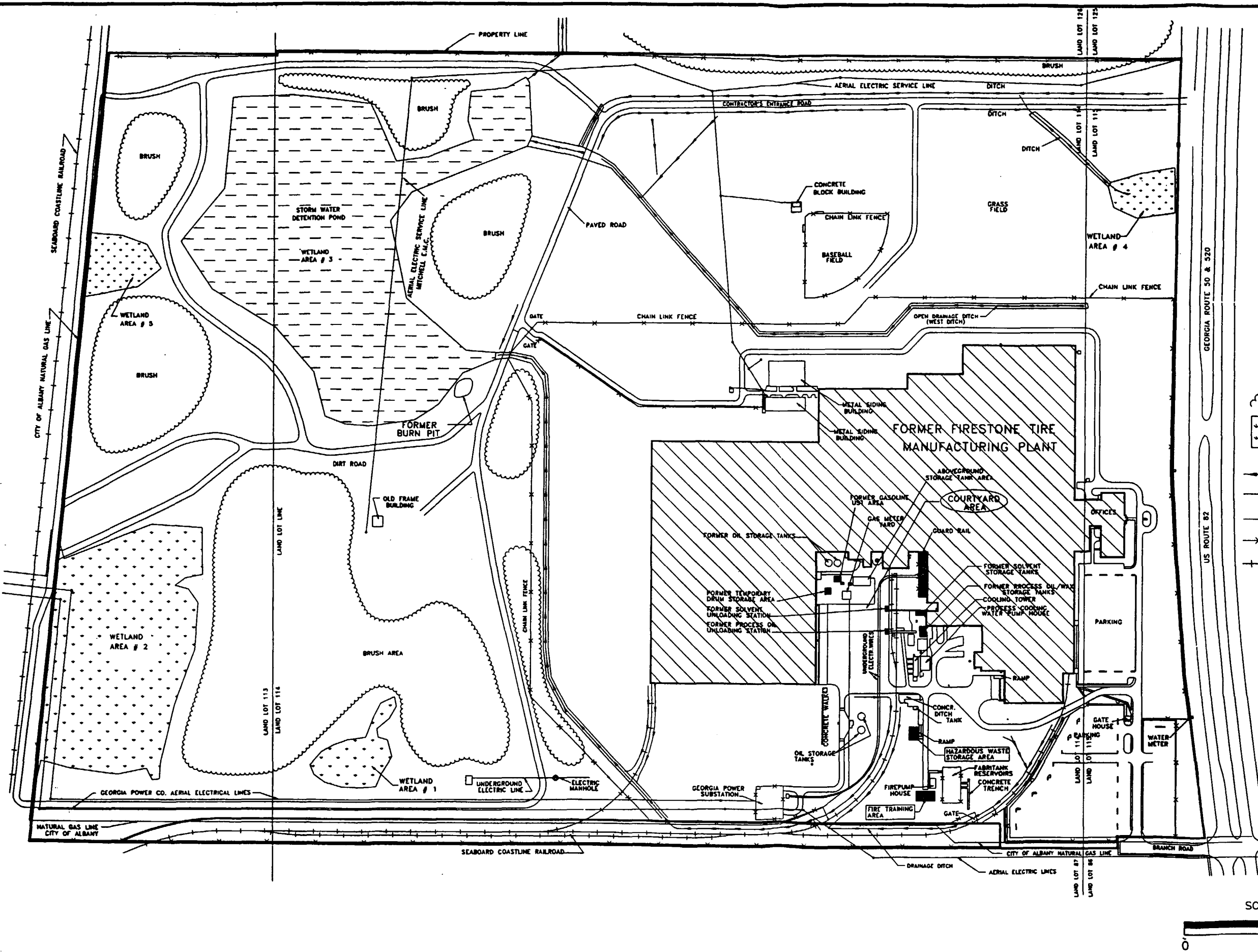
FIRESTONE TIRE & RUBBER
COMPANY SITE
ALBANY, GEORGIA
ATEC PROJECT NO 32-07-96-00067

SCALE:

FIGURE 1.1

REFERENCE: 6/20/95 (LOCMAP)

6 2 0002

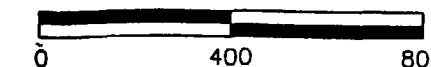
**LEGEND**

- TREE AND BRUSH AREAS
- WETLAND AREAS [Defined by 9 Jan 1990 wetland survey]
- SURFACE WATER RUNOFF
- DITCH
- AERIAL ELECTRICAL LINES
- UNDERGROUND ELECTRICAL LINES
- FENCE LINE
- RAILROAD TRACKS

NOTE:

THE LOCATION OF DIRT ROAD SYSTEM IN THE SOUTHERN HALF OF THE SITE IS APPROXIMATE.

SCALE IN FEET



SOURCE: WOODWARD-CLYDE CONSULTANTS, REMEDIAL INVESTIGATION REPORT, 1992

PROJECT

FIRESTONE TIRE & RUBBER COMPANY
COMPANY SITE
ALBANY, GEORGIA
ATEC PROJECT NO: 32-07-96-00067

ATEC Associates, Inc.
of Georgia
1300 Williams Drive
Marietta, Georgia 30066
(770)427-9456

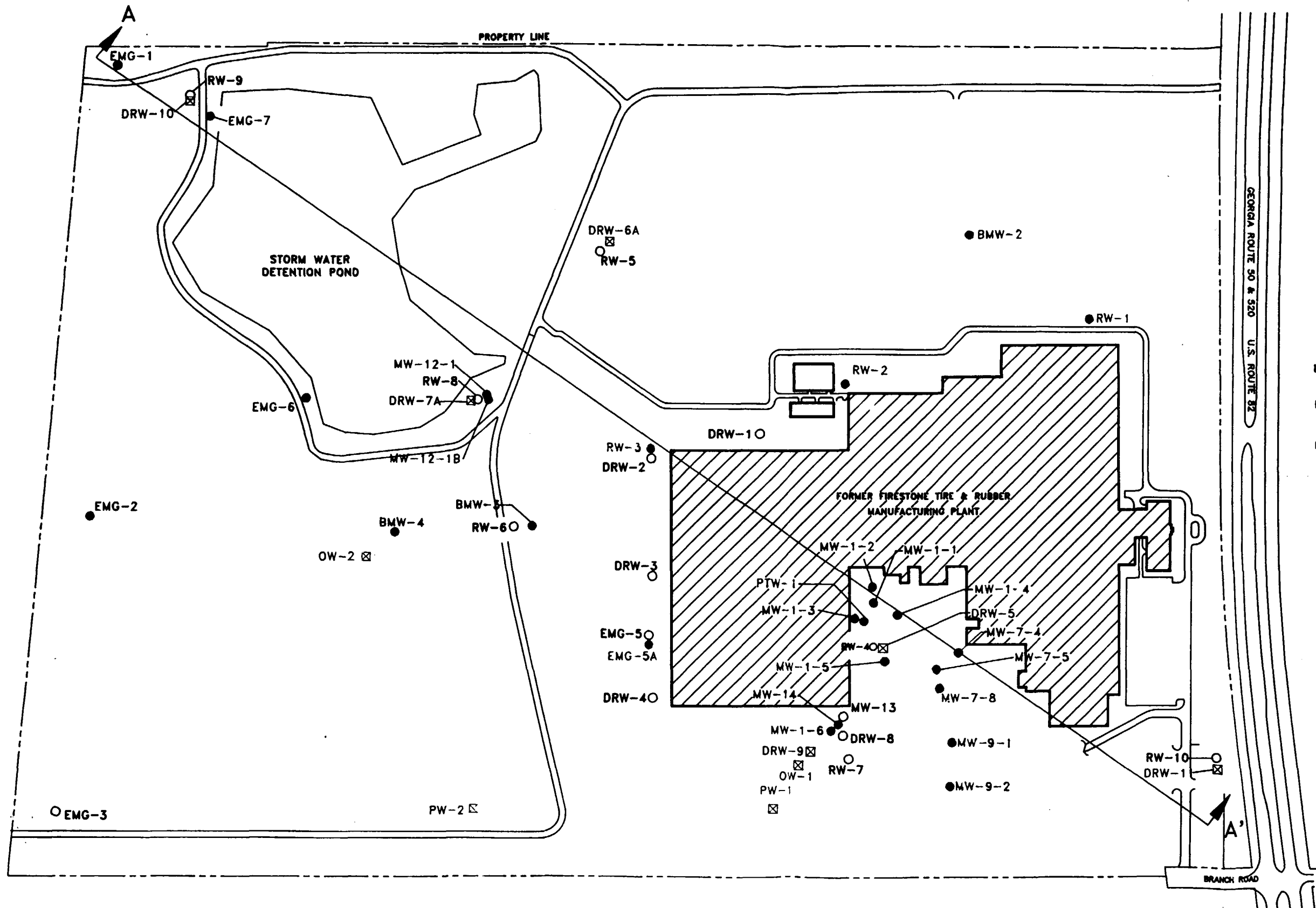
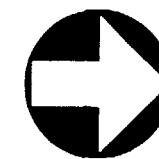
LEGEND

SITE PLAN

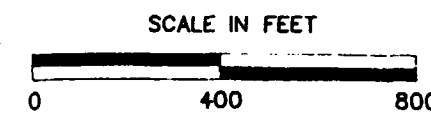
FIGURE 1.2

SCALE:

6 2 0063



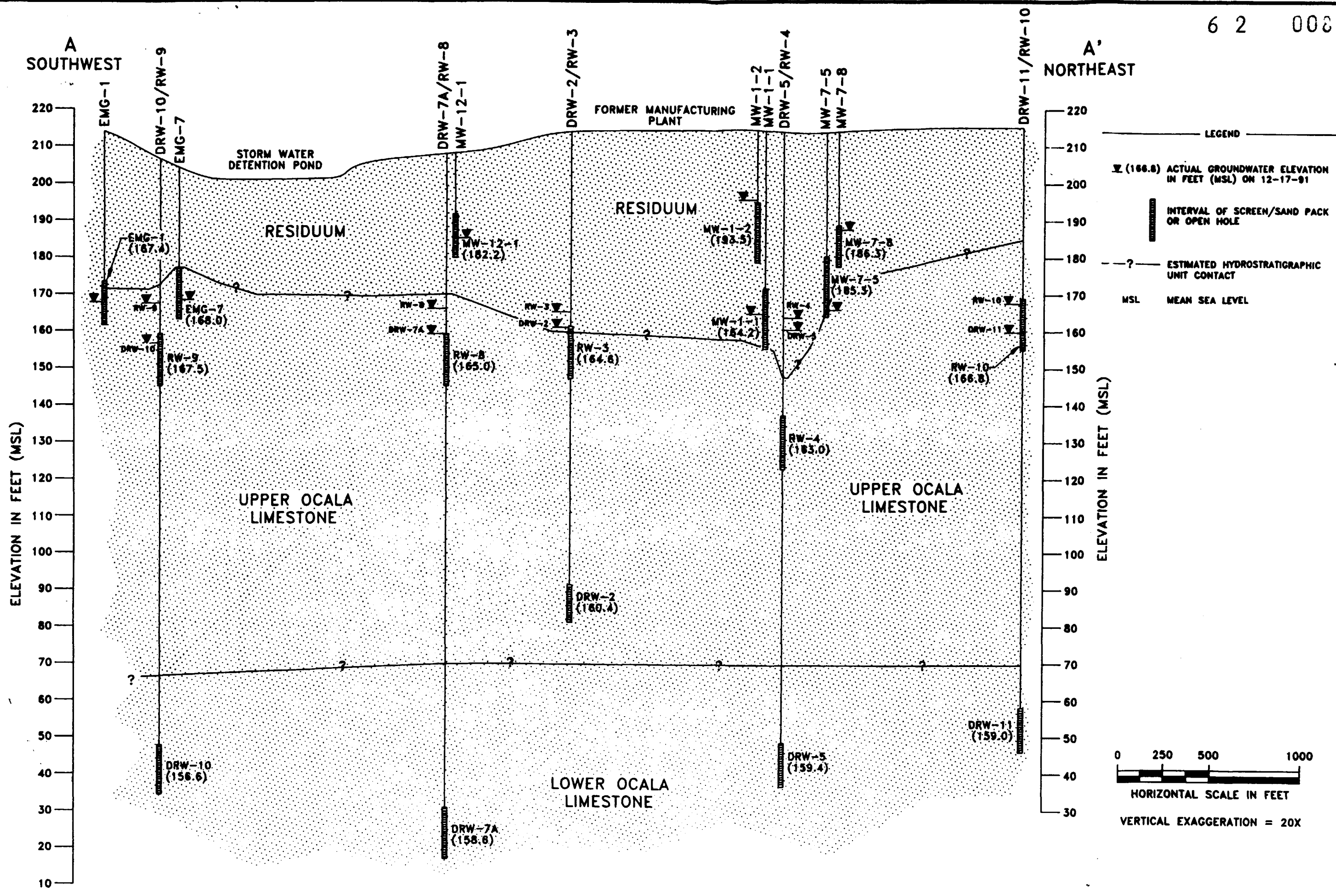
- LEGEND**
- BMW-2 RESIDUUM TRANSITION ZONE WELL
 - RW-5 UPPER OCALA LIMESTONE WELL
 - ⊠ PW-2 LOWER OCALA LIMESTONE WELL
 - - - PROPERTY BOUNDARY



PROJECT
 FIRESTONE TIRE & RUBBER
 COMPANY SITE
 ALBANY, GEORGIA
 ATEC PROJECT NO: 32-07-96-00067

ATEC Associates, Inc.
 of Georgia
 1300 Williams Drive
 Marietta, Georgia 30066
 (770)457-9456

LEGEND
 LOCATION MAP FOR
 HYDROSTRATIGRAPHIC
 CROSS SECTION A-A'



SOURCE: WOODWARD-CLYDE CONSULTANTS,
 REMEDIAL INVESTIGATION REPORT 1992

PROJECT

FIRESTONE TIRE & RUBBER
 COMPANY SITE
 ALBANY, GEORGIA
 ATEC PROJECT NO: 32-07-96-00067

ATEC Associates, Inc.

of Georgia
 1300 Williams Drive
 Marietta, Georgia 30066
 (404)427-9455

DATE: 3/15/96 (8118-14)

LEGEND

HYDROSTRATIGRAPHIC
 CROSS SECTION A-A'

FIGURE 1.4

SCALE:

Regional Hydrostratigraphic Unit		Regional Thickness (feet)
	Residuum	0-70
F L O R I D A N A Q U I F E R	Upper Ocala Limestone Formation	150-200
	Lower Ocala Limestone Formation	
c.u.	Lisbon Formation	235-340
C L A I U B O F R E N E	Tallahatta Formation	
	Hatchetigbee Formation	
c.u.	Tuscaloosa Sand and Nanafalia Formation, undifferentiated	
C L A Y T O N	Upper Clayton Formation	180-245
	Clayton Limestone Formation	
c.u.	Lower Clayton Formation	80-120
C R E T A C E O U S A Q U I F E R	Providence Sand	

Site-Specific Hydrostratigraphic Unit		Site-Specific Thickness (feet)
Residuum (Transition Zone)		25-86
F L O R I D A N A Q U I F E R	Upper Ocala Limestone Formation	45-125
	Lower Ocala Limestone Formation	100-140
c.u.	Lisbon Formation	Not Fully Penetrated

Notes: c.u. - confining unit
No vertical scale is intended.

Source: Hicks, D.W., R.E., Krause, and J.S. Clarke, 1981. *Geohydrology of the Albany Area, Georgia. Information Circular 57 Georgia Geologic Survey, Atlanta, Georgia*

Source: Woodward-Clyde Consultants, 1992. *Remedial Investigation Report, Former Firestone Rubber Tire Facility, Albany, Georgia, on file at USEPA Region IV, Atlanta, Georgia*

LEGEND

SUMMARY OF REGIONAL
AND SITE-SPECIFIC
HYDROSTRATIGRAPHIC UNITS

FIGURE 1.5



ATEC Associates, Inc.

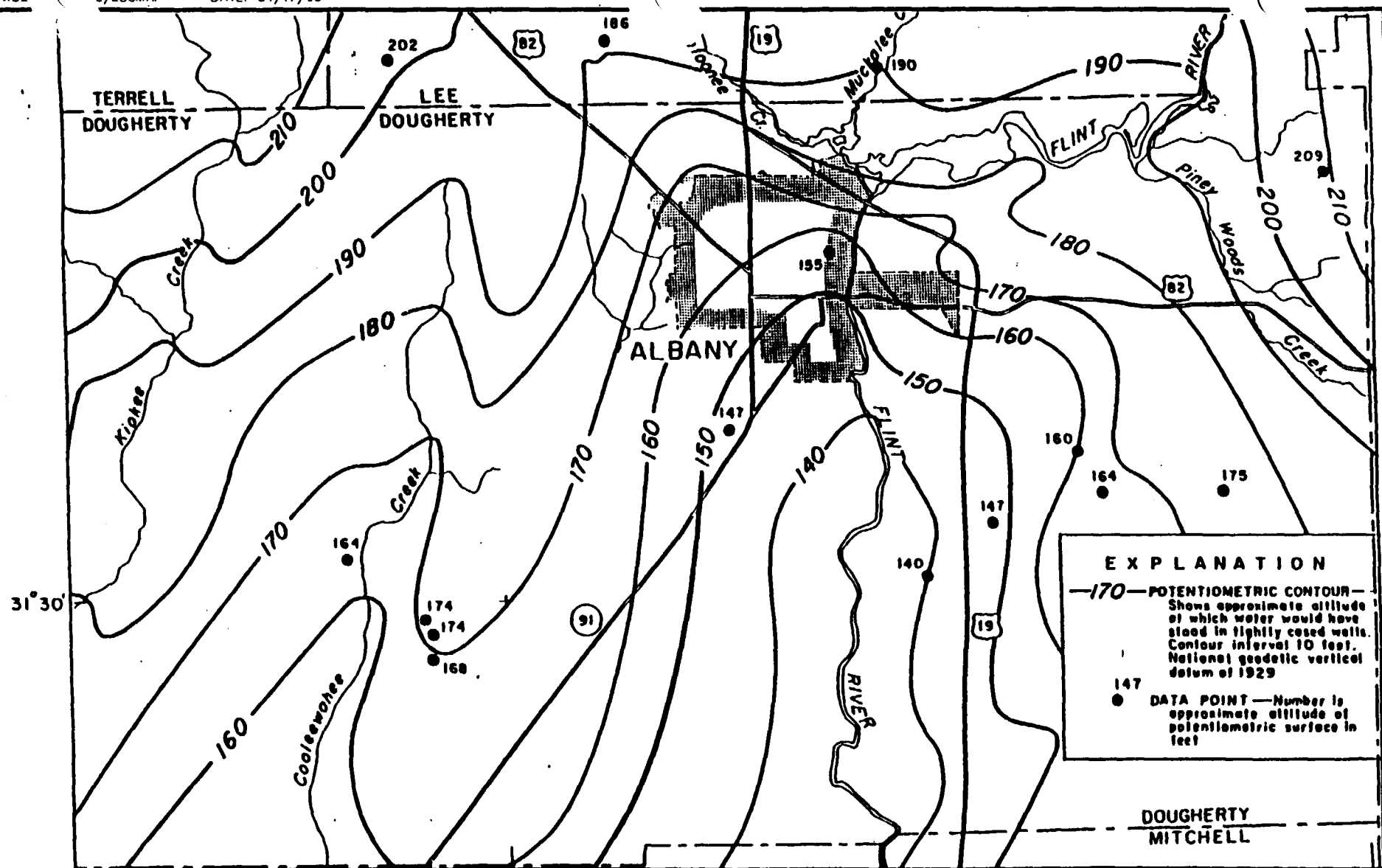
of Georgia
1300 Williams Drive
Marietta, Georgia 30066
(404)427-9456

PROJECT

FIRESTONE TIRE & RUBBER
COMPANY SITE
ALBANY, GEORGIA
ATEC PROJECT NO: 32-07-96-00067

SCALE:

REFERENCE: 5/15/96 (LOCMAP)



EXPLANATION

—170—POTENTIOMETRIC CONTOUR—
Shows approximate altitude of which water would have stood in tightly cased wells. Contour interval 10 feet. National geodetic vertical datum of 1929

● DATA POINT—Number is approximate altitude of potentiometric surface in feet

Base from U.S. Geological Survey
1:24,000 quadrangles

0 5 10 MILES

Hydrology from G.D. Mitchell, 1979

SOURCE: GEOHYDROLOGY OF THE ALBANY, GEORGIA AREA; U.S.G.S., 1987

LEGEND

POTENTIOMETRIC SURFACE OF THE OCALA
AQUIFER IN THE ALBANY AREA
NOVEMBER 1979

FIGURE 1.6

SCALE:

ATEC Associates, Inc.

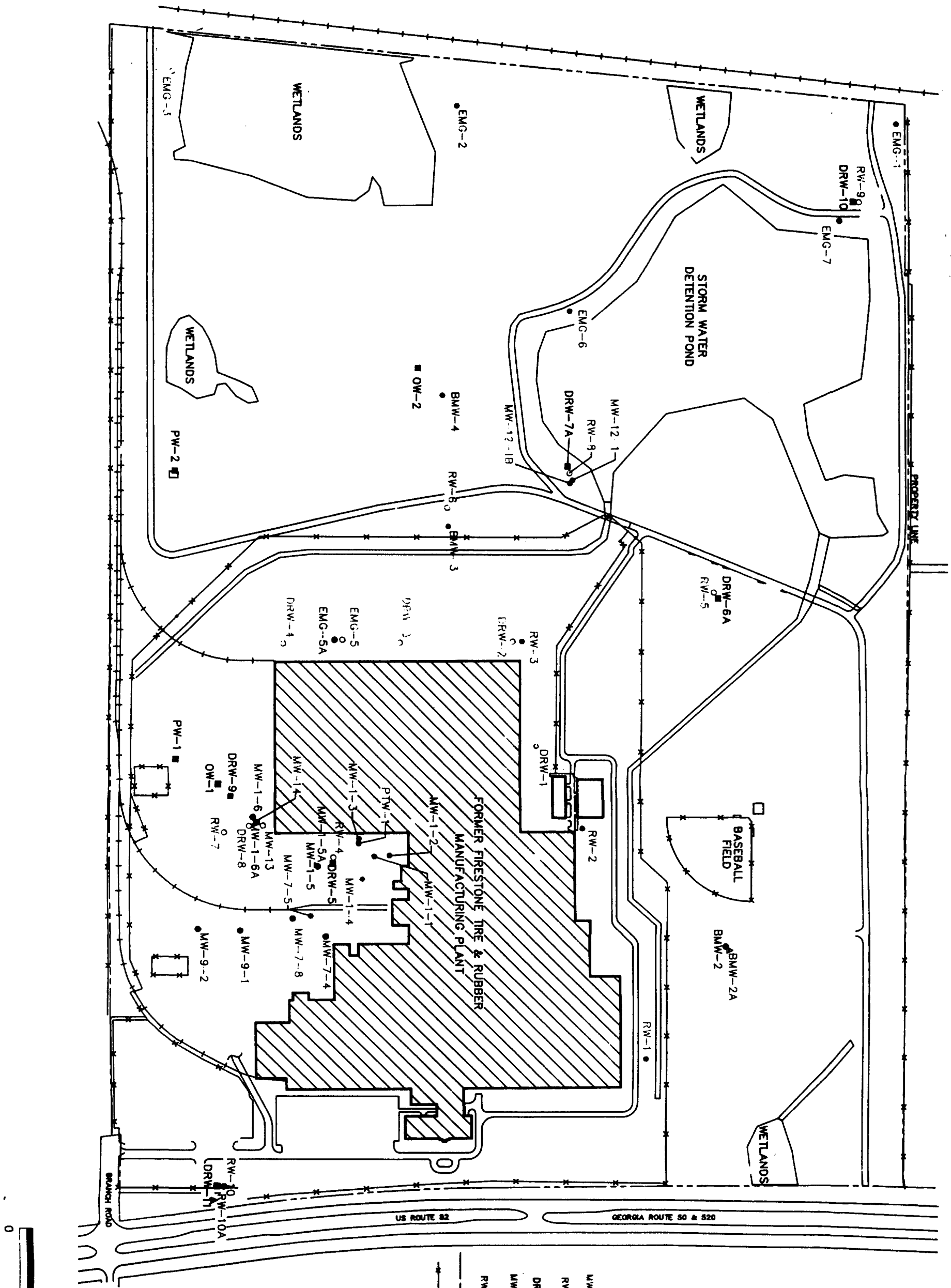
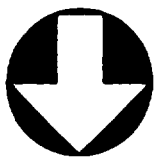


of Georgia
1300 Williams Drive
Marietta, Georgia 30066
(770)427-9456

REFERENCE: 5/13/96 (LOCMAP)

PROJECT

FIRESTONE TIRE & RUBBER
COMPANY SITE
ALBANY, GEORGIA
ATEC PROJECT NO: 32-07-96-00067



SCALE IN FEET
0 400 800

- LEGEND
- MW-1-4 RESIDUUM/TRANSITION ZONE WELL
 - RW-10 UPPER OCALA LIMESTONE WELL
 - DRW-5 LOWER OCALA LIMESTONE WELL
 - MW-9-7 WELLS ABANDONED FEBRUARY/MARCH 1995
 - RW-10A WELLS INSTALLED FEBRUARY/MARCH 1995
 - FENCE LINE
 - - - PROPERTY BOUNDARY

LEGEND

SITE PLAN/MONITORING WELL LOCATION MAP

FIGURE 2.1

ATEC Associates, Inc.

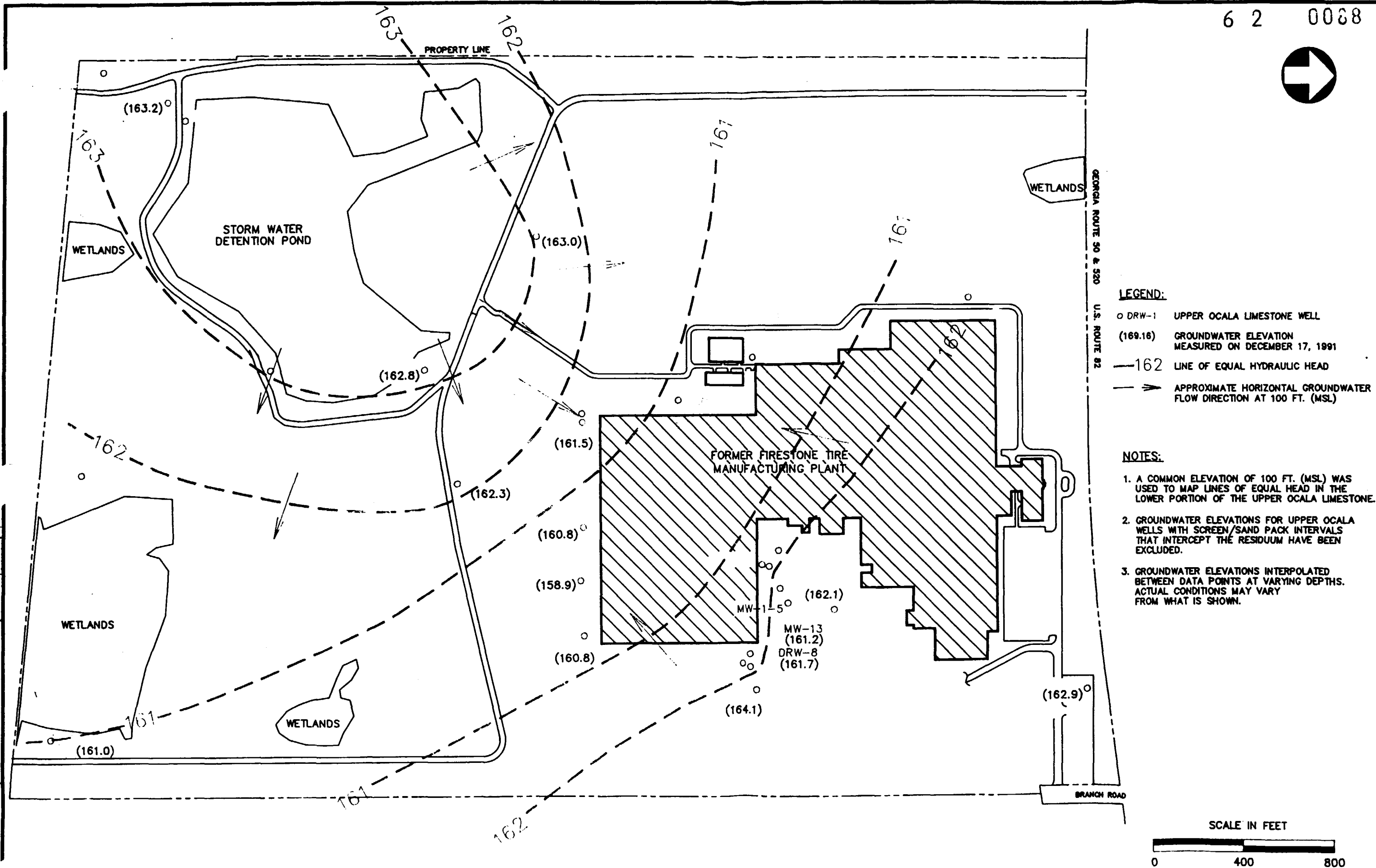


of Georgia
1300 Williams Drive
Marietta, Georgia 30066
(770)427-8486

PROJECT

FIRESTONE TIRE & RUBBER
COMPANY SITE
ALBANY, GEORGIA
ATEC PROJECT NO: 32-07-96-00067

6 2 0088



SOURCE: WOODWARD-CLYDE CONSULTANTS, REMEDIAL INVESTIGATION REPORT, 1992

PROJECT

FIRESTONE TIRE & RUBBER
COMPANY SITE
ALBANY, GEORGIA
ATEC PROJECT NO: 32-07-96-00067

ATEC Associates, Inc.

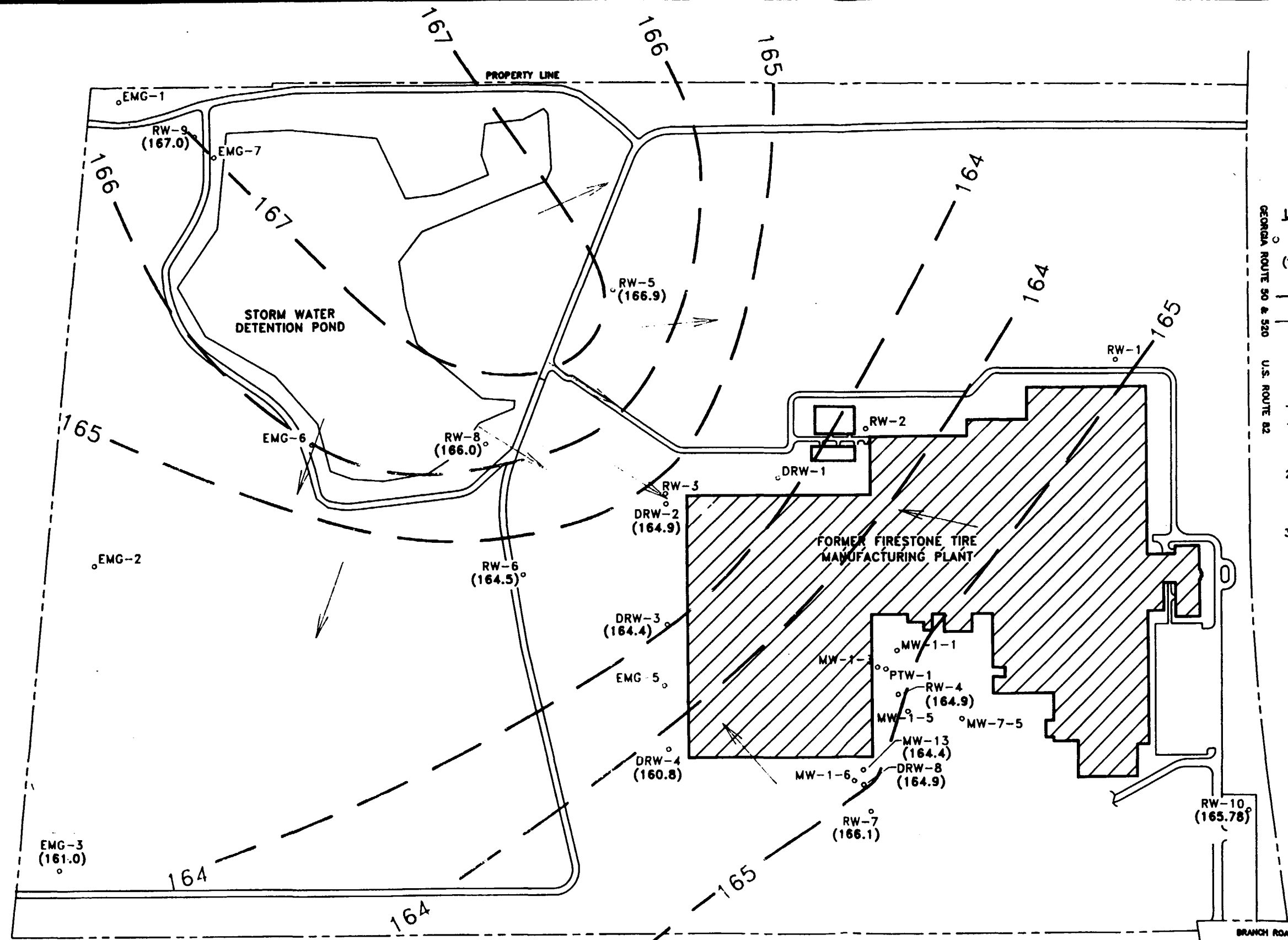
of Georgia
1300 Williams Drive
Marietta, Georgia 30066
(770) 427-9406

**POTENTIOMETRIC SURFACE
OF THE UPPER OCALA
DECEMBER 17, 1991**

FIGURE 2.2

DATE: 4/18/96

6 2 0089

GEORGIA ROUTE 50 & 520
U.S. ROUTE 82**LEGEND:**

- DRW-1 UPPER OCALA LIMESTONE WELL
- (169.16) GROUNDWATER ELEVATION MEASURED ON JUNE 16, 1995
- 162 LINE OF EQUAL HYDRAULIC HEAD
- APPROXIMATE HORIZONTAL GROUNDWATER FLOW DIRECTION AT 100 FT. (MSL)

NOTES:

1. A COMMON ELEVATION OF 100 FT. (MSL) WAS USED TO MAP LINES OF EQUAL HEAD IN THE LOWER PORTION OF THE UPPER OCALA LIMESTONE.
2. GROUNDWATER ELEVATIONS FOR UPPER OCALA WELLS WITH SCREEN/SAND PACK INTERVALS THAT INTERCEPT THE RESIDUUM HAVE BEEN EXCLUDED.
3. GROUNDWATER ELEVATIONS INTERPOLATED BETWEEN DATA POINTS AT VARYING DEPTHS. ACTUAL CONDITIONS MAY VARY FROM WHAT IS SHOWN.

SCALE IN FEET

**PROJECT**

FIRESTONE TIRE & RUBBER
COMPANY SITE
ALBANY, GEORGIA
ATEC PROJECT NO: 32-07-96-00067

ATEC Associates, Inc.

of Georgia
1300 Williams Drive
Marietta, Georgia 30066
(770) 427-8486

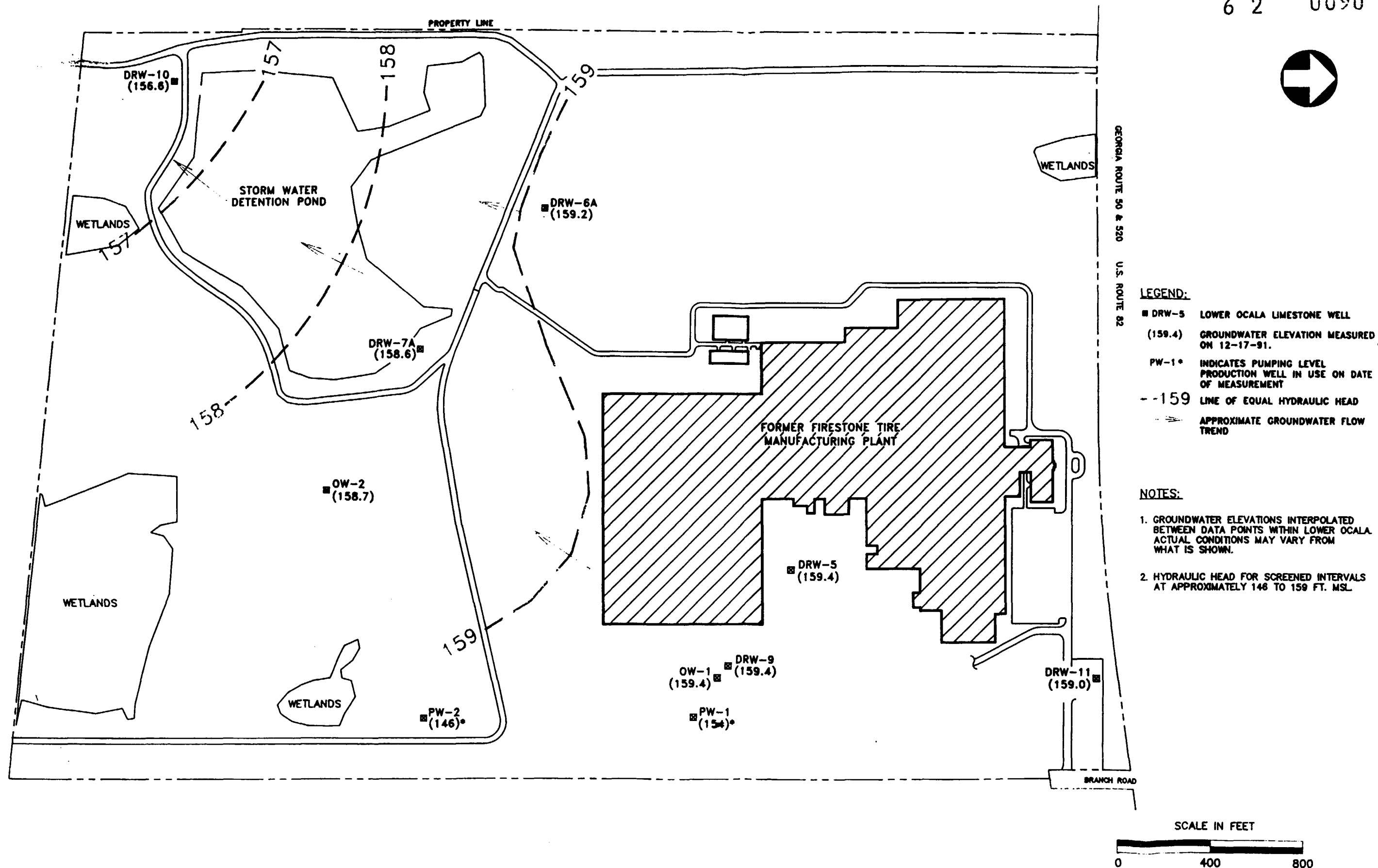
REVISION 5/15/96 (8116-19)

LEGEND

POTENTIOMETRIC SURFACE
OF THE UPPER OCALA LIMESTONE
ELEVATION 100 FT. (MSL)
JUNE 16, 1992

FIGURE 2.3

SCALE:



SOURCE: WOODWARD-CLYDE CONSULTANTS, REMEDIAL INVESTIGATION REPORT, 1992

PROJECT

FIRESTONE TIRE & RUBBER
COMPANY SITE
ALBANY, GEORGIA
ATEC PROJECT NO: 32-07-96-00067

ATEC Associates, Inc.

of Georgia
1300 Williams Drive
Marietta, Georgia 30066
(770)487-8466

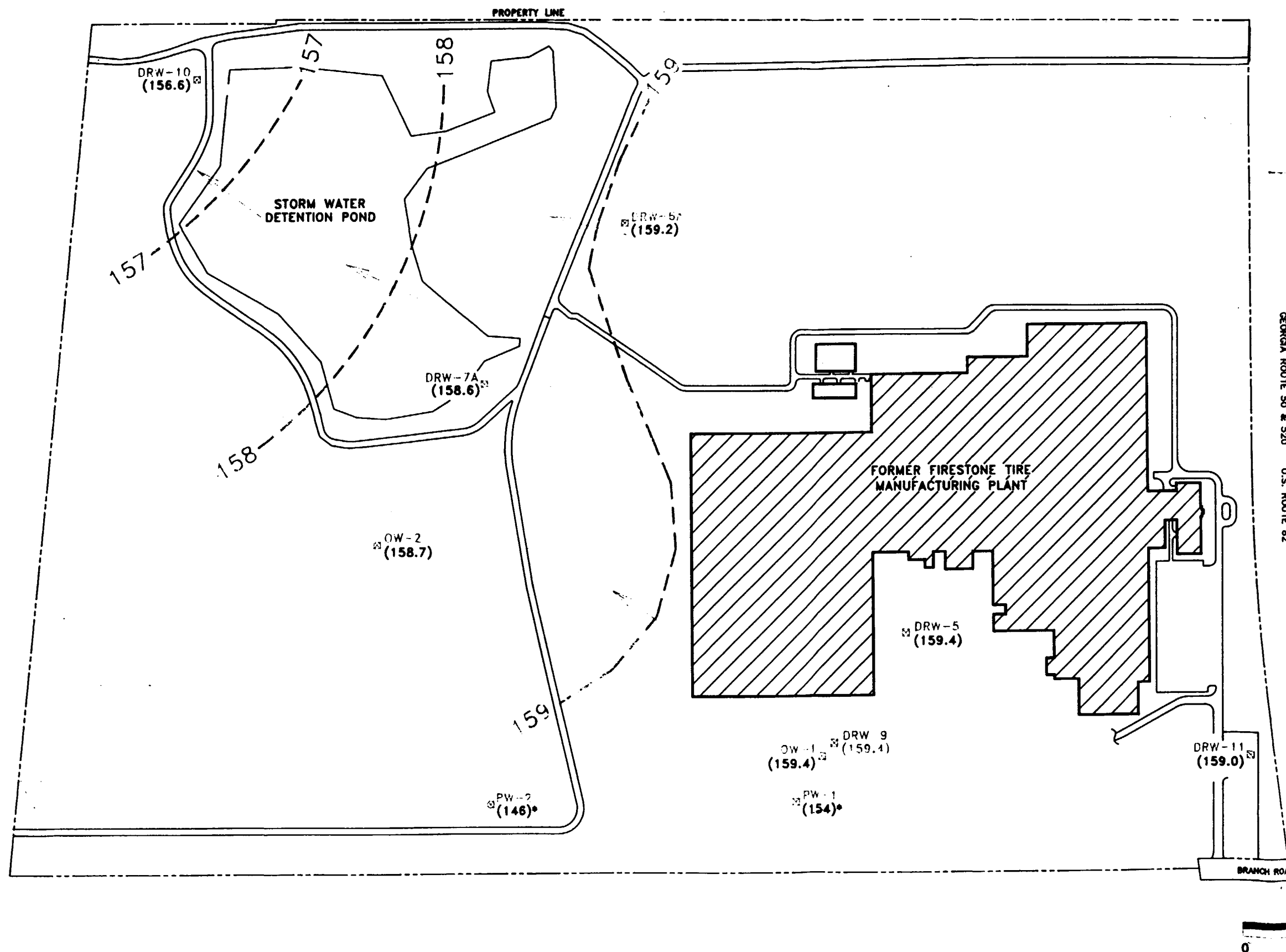
REVISIONS 5/15/96 (FIG-2)

LEGEND

POTENTIOMETRIC SURFACE
LOWER Ocala LIMESTONE
DECEMBER 17, 1991

FIGURE 2.4

SCALE:



LEGEND:

- DRW-11 ■ LOWER Ocala LIMESTONE WELL
(159.4) GROUNDWATER ELEVATION MEASURED ON JUNE 16, 1992
PW-1* INDICATES PUMPING LEVEL PRODUCTION WELL IN USE ON DATE OF MEASUREMENT
--- 159 --- LINE OF EQUAL HYDRAULIC HEAD
→ APPROXIMATE GROUNDWATER FLOW TREND

- NOTES: 1. GROUNDWATER ELEVATIONS INTERPOLATED BETWEEN DATA POINTS WITHIN LOWER Ocala. ACTUAL CONDITIONS MAY VARY FROM WHAT IS SHOWN.
2. HYDRAULIC HEAD FOR SCREENED INTERVALS AT APPROXIMATELY 146 TO 159 FT. MSL.

GEORGIA ROUTE 50 & 520 U.S. ROUTE 82

SCALE IN FEET



SOURCE: WOODWARD-CLYDE CONSULTANTS, REMEDIAL INVESTIGATION REPORT, 1992

PROJECT

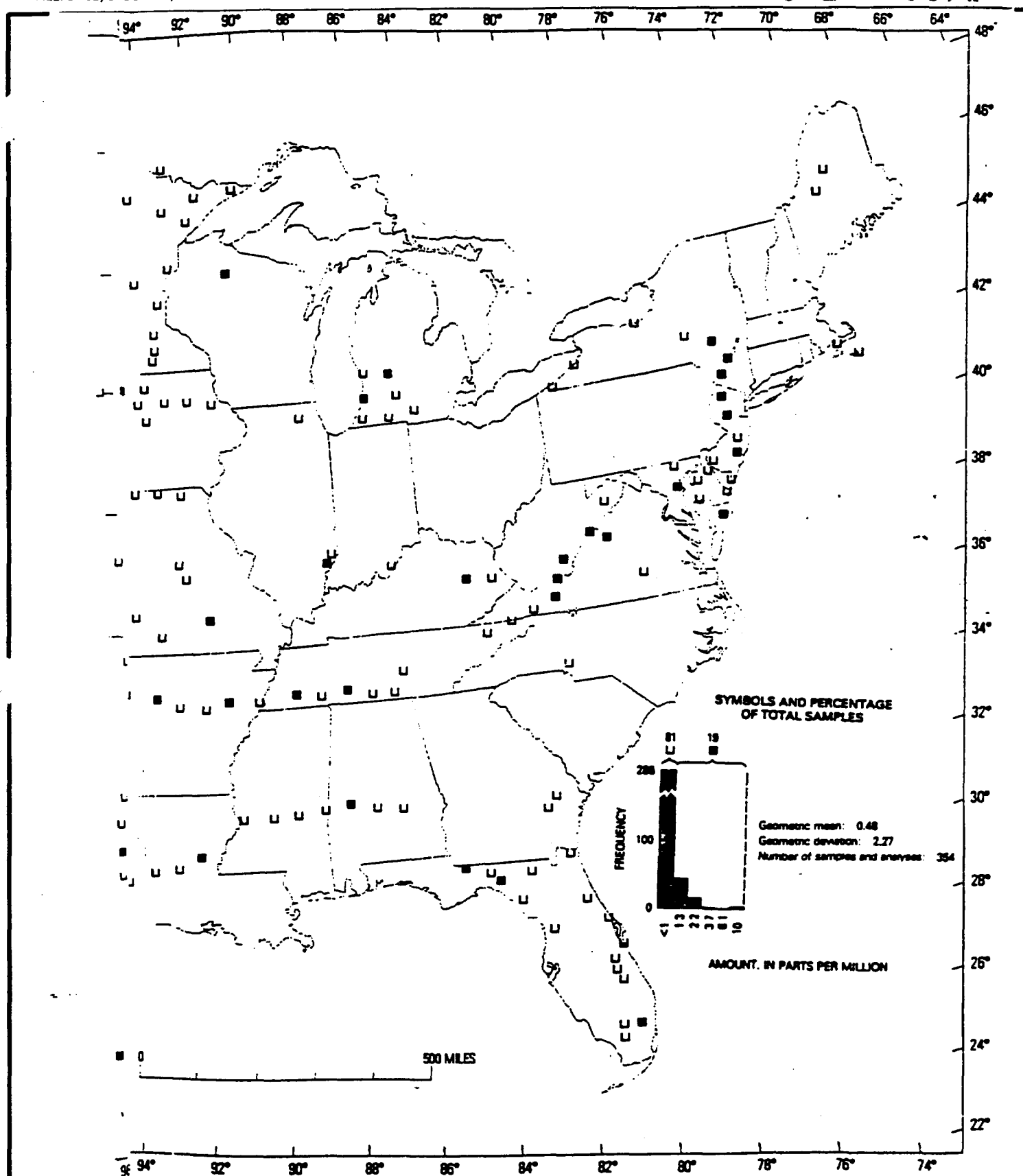
FIRESTONE TIRE & RUBBER
COMPANY SITE
ALBANY, GEORGIA
ATEC PROJECT NO: 32-07-96-00067

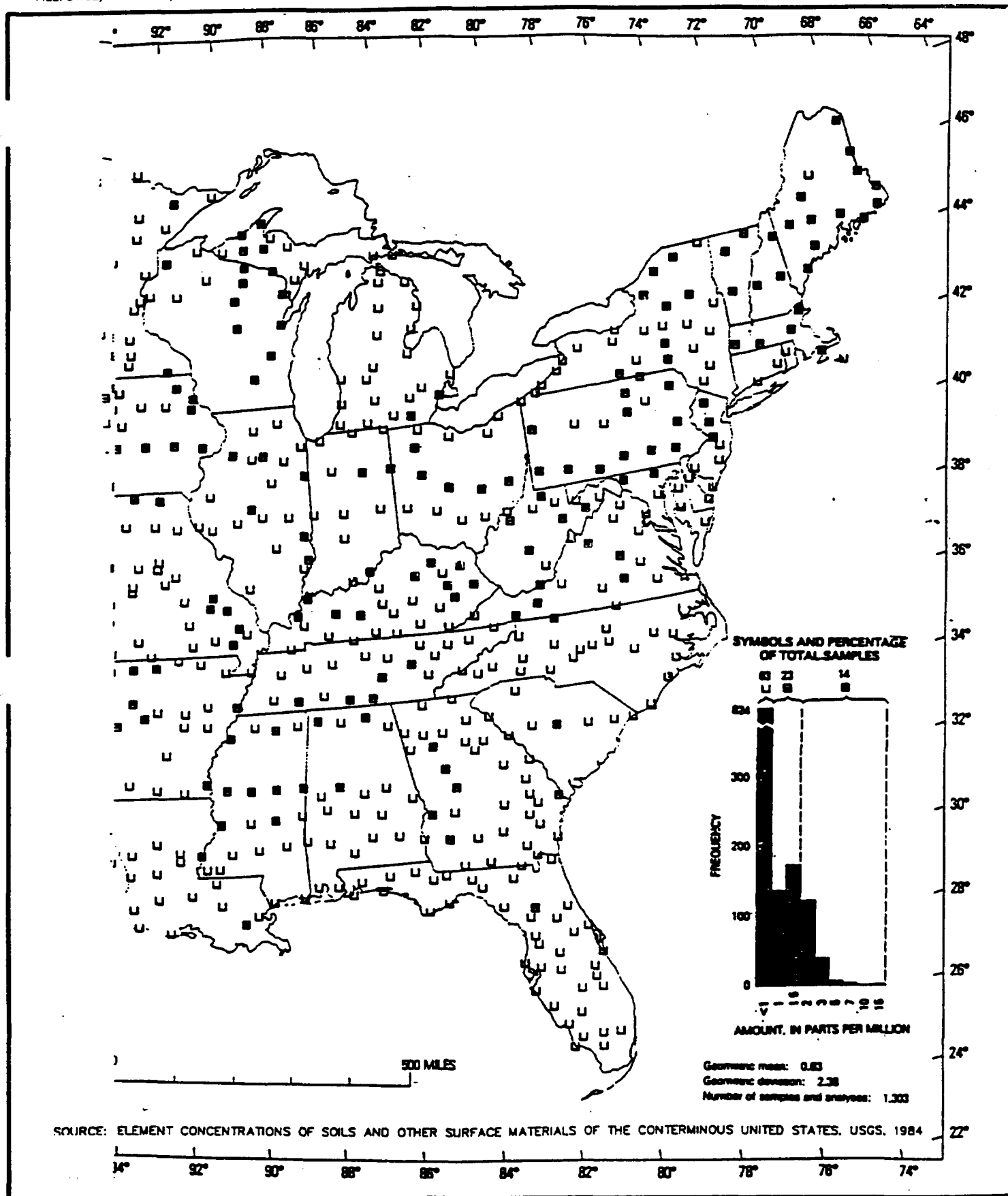
ATEC Associates, Inc.

of Georgia
1300 Williams Drive
Marietta, Georgia 30066
(770) 427-9436

LEGEND

POTENTIOMETRIC SURFACE
LOWER Ocala LIMESTONE
JUNE 16, 1992





LEGEND

BERYLLIUM CONTENT
OF SURFICIAL MATERIALS

SCALE:

FIGURE 4.2

ATEC Associates, Inc.

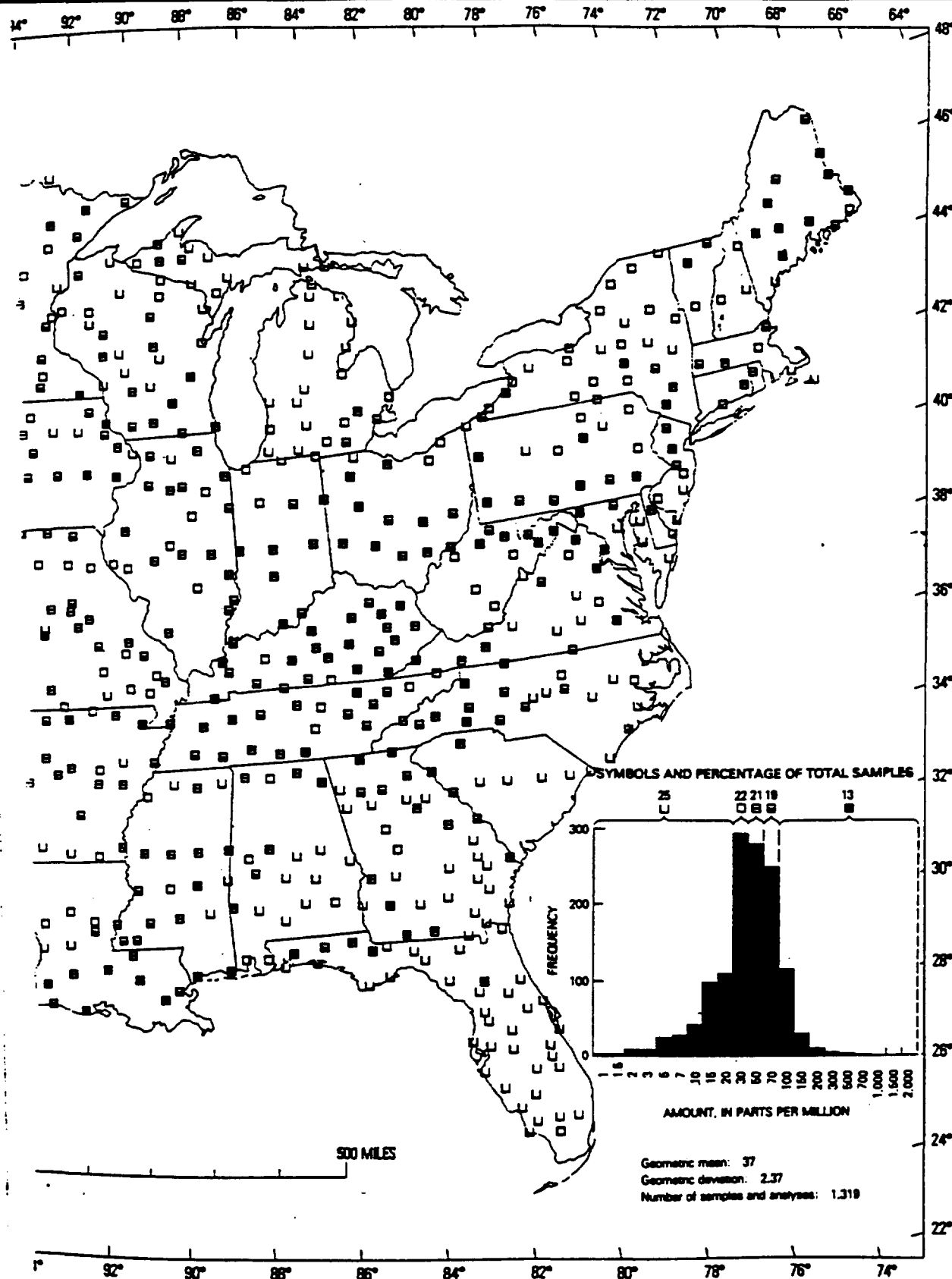


of Georgia
1300 Williams Drive
Marietta, Georgia 30066
(404)427-9456

REFERENCE: 5/15/96 (LOCMAP)

PROJECT

FIRESTONE TIRE & RUBBER
COMPANY SITE
ALBANY, GEORGIA
ATEC PROJECT NO: 32-07-96-00067



SOURCE: ELEMENT CONCENTRATIONS OF SOILS AND OTHER SURFACE MATERIALS OF THE CONTERMINOUS UNITED STATES. USGS, 1984

LEGEND

CHROMIUM CONTENT
OF SURFICIAL MATERIALS

ATEC Associates, Inc.

of Georgia
1300 Williams Drive
Marietta, Georgia 30066
(404)427-9456

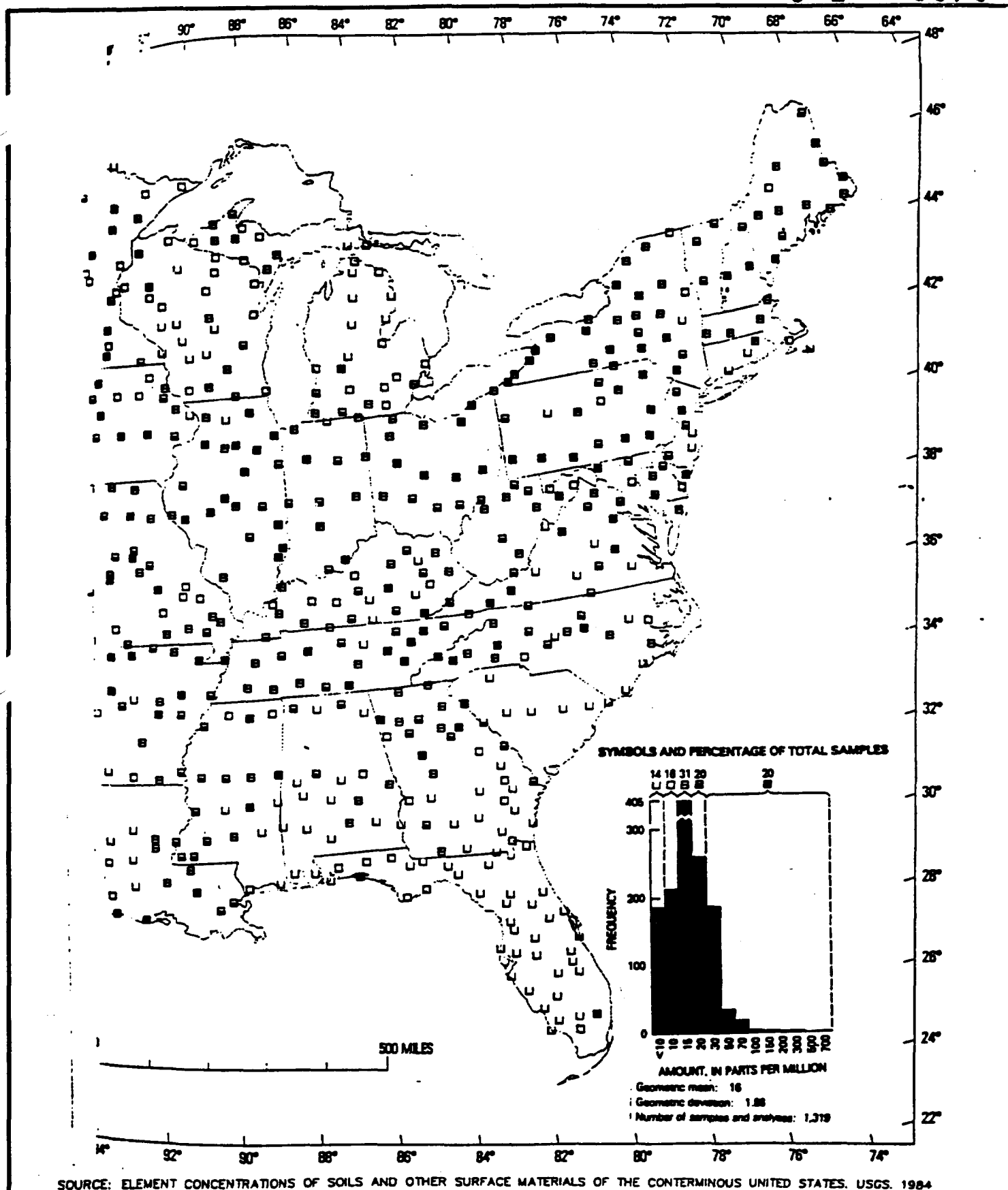
PROJECT

FIRESTONE TIRE & RUBBER
COMPANY SITE
ALBANY, GEORGIA
ATEC PROJECT NO: 32-07-96-00067

SCALE:

FIGURE 4.3

REFERENCE: 5/15/96 (LOCMAP)



SOURCE: ELEMENT CONCENTRATIONS OF SOILS AND OTHER SURFACE MATERIALS OF THE CONTERMINOUS UNITED STATES. USGS. 1984

LEGEND

LEAD CONTENT
OF SURFICIAL MATERIALS

ATEC Associates, Inc.

of Georgia
1300 Williams Drive
Marietta, Georgia 30066
(404)427-9456

PROJECT

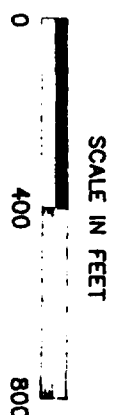
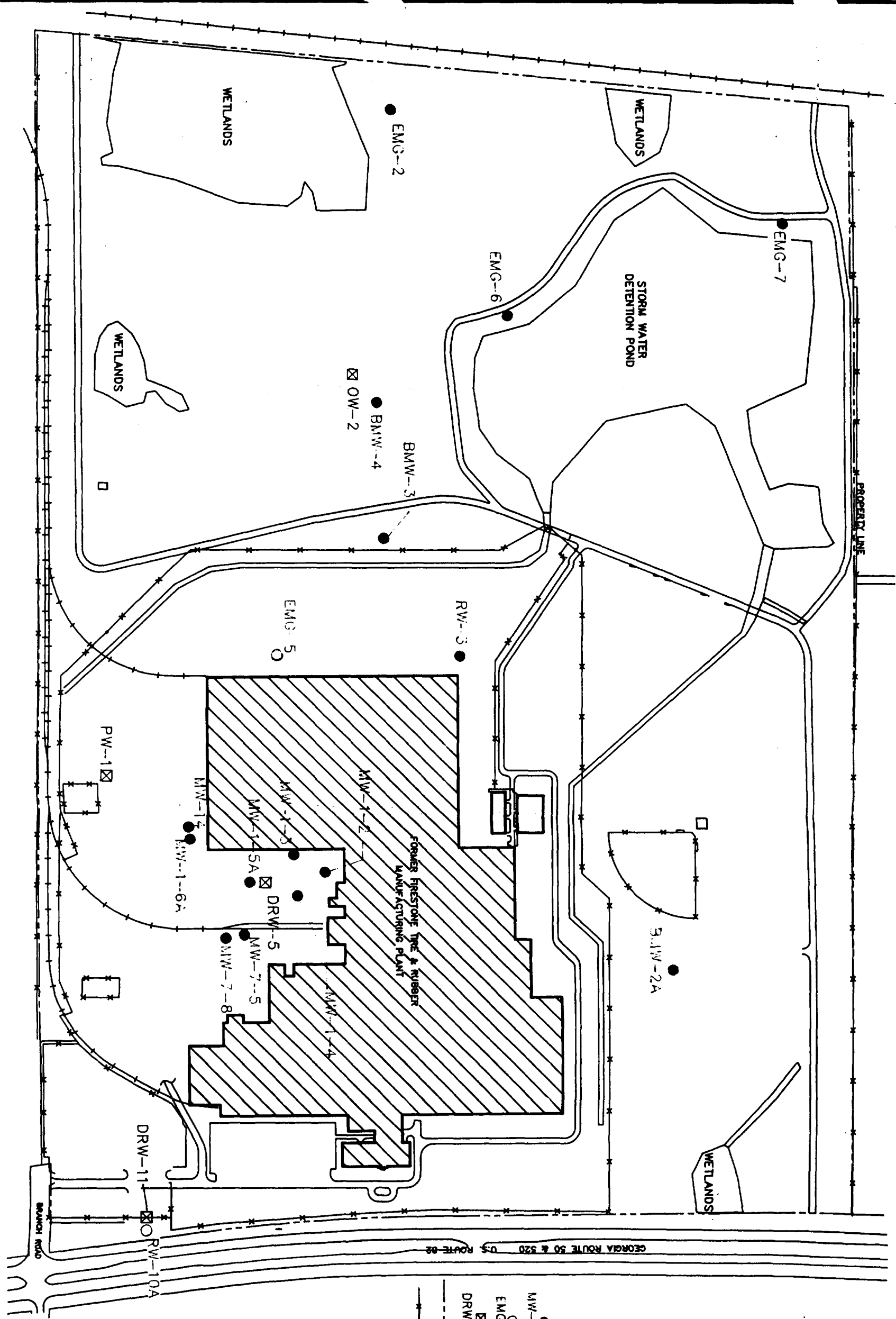
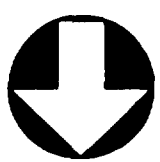
FIRESTONE TIRE & RUBBER
COMPANY SITE
ALBANY, GEORGIA
ATEC PROJECT NO: 32-07-96-00067

SCALE:

FIGURE 4.4

REFERENCE: 5/15/96 (LOCMAP)

6 2 0096



SOURCE: WOODWARD-CLYDE CONSULTANTS, REMEDIAL INVESTIGATION REPORT, 1992

- LEGEND
- MW-1-4 RESIDUUM/TRANSITION ZONE WELL
 - EMG-5 UPPER OCALA LIMESTONE WELL
 - ⊠ DRW-11 LOWER OCALA LIMESTONE WELL
 - - - - - PROPERTY BOUNDARY
 - - - - - FENCE LINE

LEGEND

GROUND-WATER
SAMPLING LOCATIONS
ROUNDS V AND VI

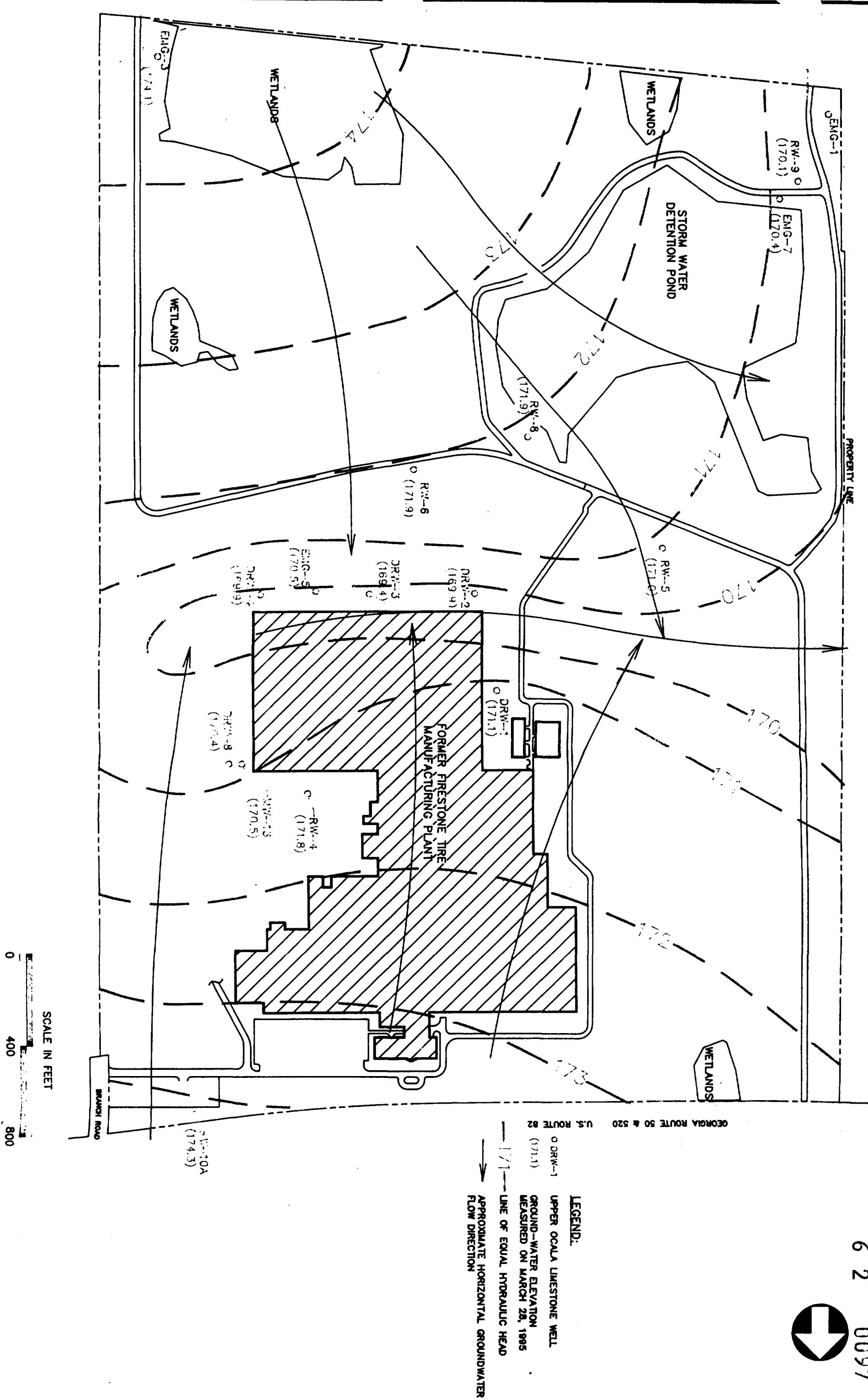
FIGURE 5.1

ATEC Associates, Inc.
of Georgia
1500 Williams Drive
Marietta, Georgia 30066
(770)427-9466

PROJECT

FIRESTONE TIRE & RUBBER
COMPANY SITE
ALBANY, GEORGIA
ATEC PROJECT NO: 32-07-96-00067

SCALE:

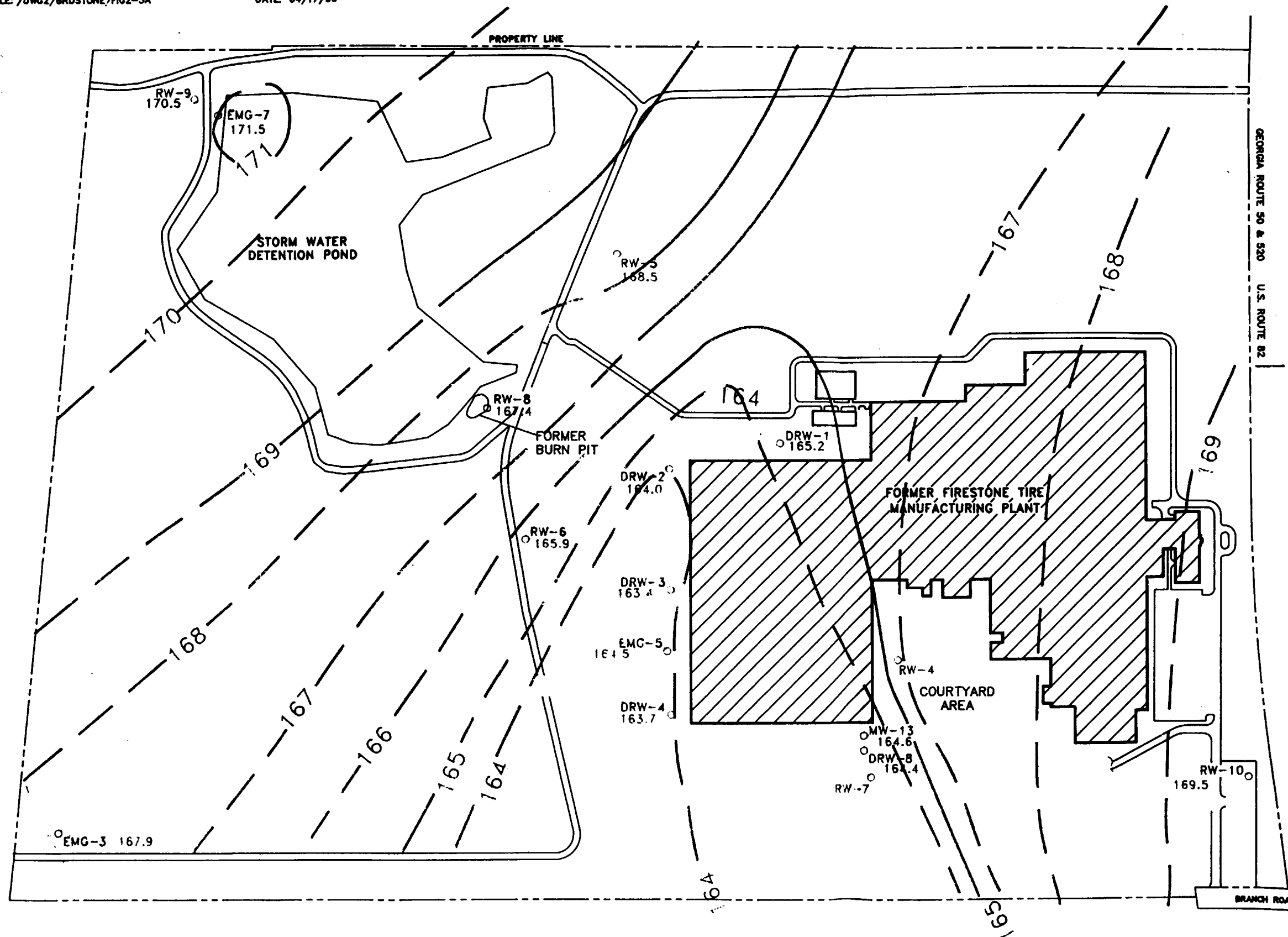


SOURCE: WOODWARD-CLYDE CONSULTANTS, REMEDIAL INVESTIGATION REPORT, 1992

POTENTIOMETRIC SURFACE
UPPER OCALA LIMESTONE
MARCH 28, 1995

ATEC Associates, Inc.
of Georgia
1300 Williams Drive
Marietta, Georgia 30066
(770)427-8456

PROJECT
FIRESTONE TIRE & RUBBER
COMPANY SITE
ALBANY, GEORGIA
ATEC PROJECT NO: 32-07-96-0067

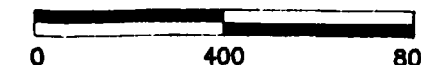
**LEGEND:**

- RW-5 UPPER OCALA LIMESTONE WELL
- 166.9 GROUND-WATER ELEVATION MEASURED ON MAY 22, 1995

— 169 LINE OF EQUAL HYDRAULIC HEAD
 FIGURE DENOTES SITE LAYOUT AS OF
 AUGUST THROUGH SEPTEMBER, 1991

NO COCs WERE DETECTED ABOVE ROD
 SPECIFIED CLEAN-UP LEVELS IN UPPER OCALA

SCALE IN FEET



PROJECT

FIRESTONE TIRE & RUBBER
 COMPANY SITE
 ALBANY, GEORGIA
 ATEC PROJECT NO: 32-07-96-00067

ATEC Associates, Inc.
 of Georgia
 1300 Williams Drive
 Marietta, Georgia 30066
 (770) 457-8456

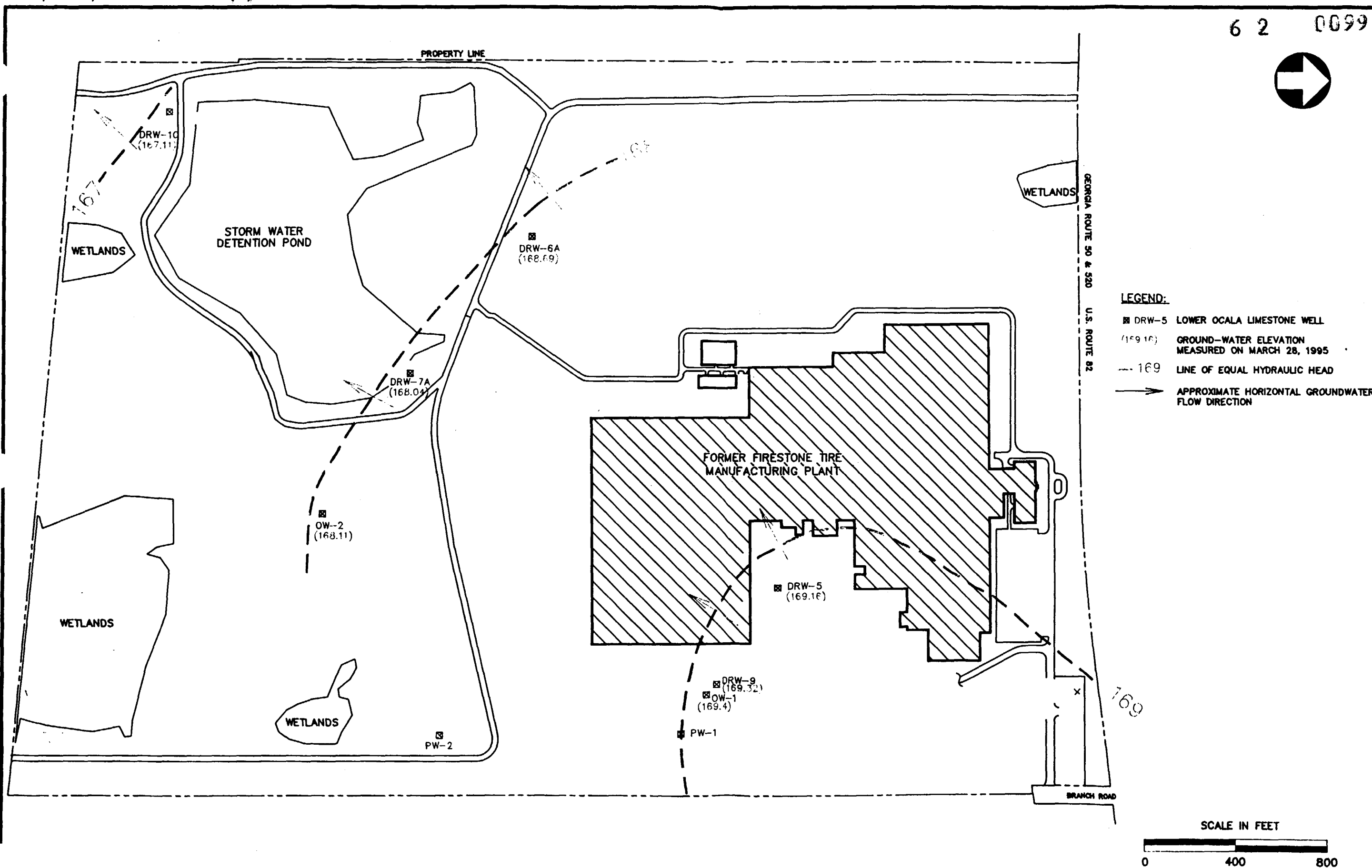
LEGEND

POTENTIOMETRIC SURFACE
 UPPER OCALA WELLS
 MAY 22, 1995

FIGURE 5.3

SCALE:

6 2 0099



SOURCE: WOODWARD-CLYDE CONSULTANTS, REMEDIAL INVESTIGATION REPORT, 1992

PROJECT

FIRESTONE TIRE & RUBBER
COMPANY SITE
ALBANY, GEORGIA
ATEC PROJECT NO: 32-07-96-00067

ATEC Associates, Inc.

of Georgia
1300 Williams Drive
Marietta, Georgia 30066
(770) 427-8458

LEGEND

POTENTIOMETRIC SURFACE
LOWER Ocala LIMESTONE
MARCH 28, 1995

PROPERTY LINE

DRW-10
161.4STORM WATER
DETENTION PONDDRW-6A
162.6DRW-7
162.2FORMER
BURN PITOW-2
162.3FORMER FIRESTONE TIRE
MANUFACTURING PLANTCOURTYARD
AREA
DRW-5
163.0OW-1
163.3DRW-9
163.2

PW-1

DRW-11
163.0

PW-2

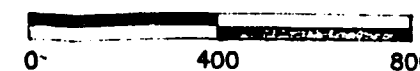
GEORGIA ROUTE 50 & 520 U.S. ROUTE 82

LEGEND:

■ DRW-11 LOWER OCALA LIMESTONE WELL
(1570) GROUND-WATER ELEVATION
MAY 22, 1995

161 LINE OF EQUAL HYDRAULIC HEAD

SCALE IN FEET



LEGEND

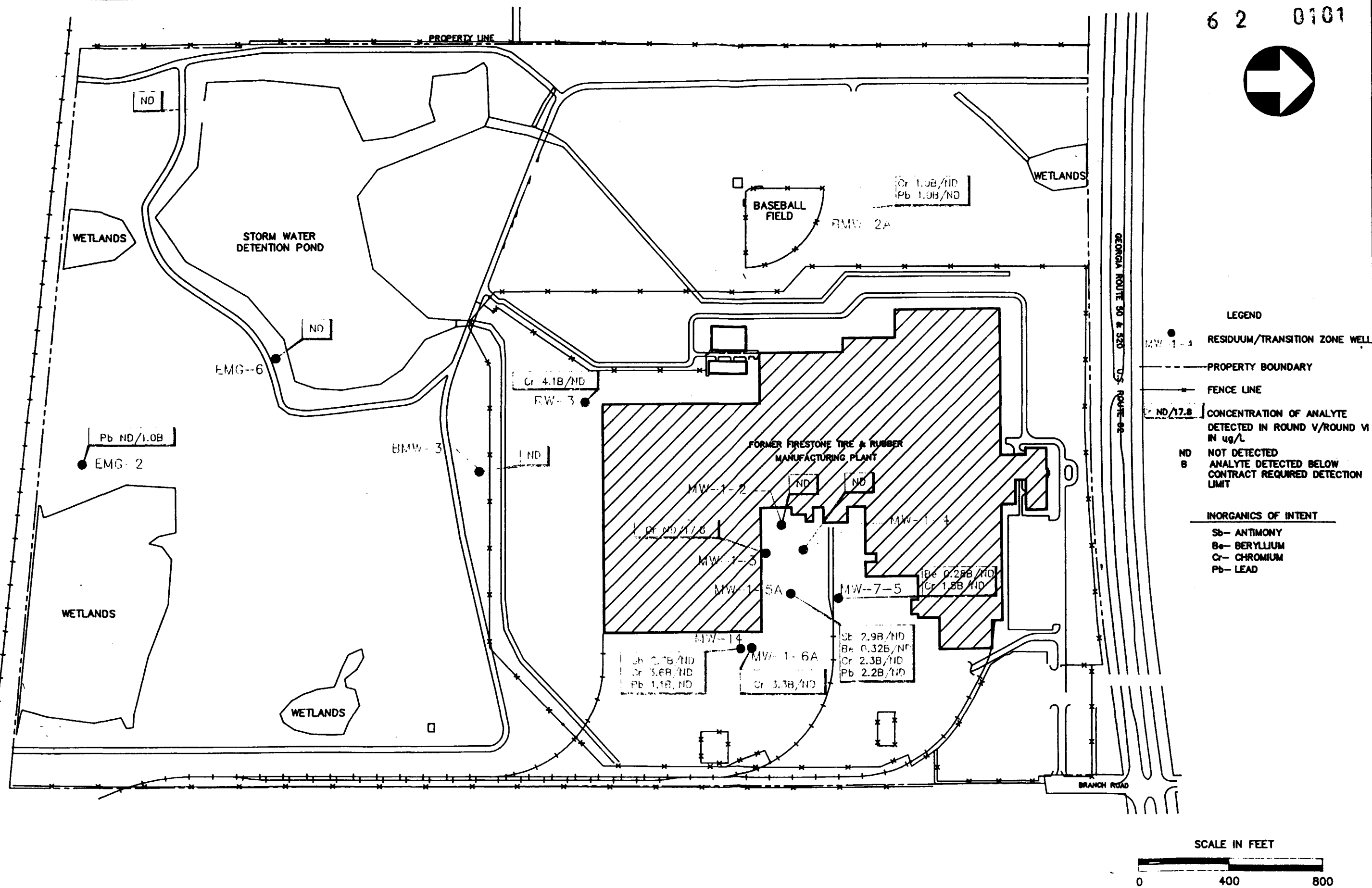
POTENTIOMETRIC SURFACE
LOWER OCALA LIMESTONE WELLS
MAY 22, 1995

ATEC Associates, Inc.
of Georgia
1300 Williams Drive
Marietta, Georgia 30066
(770) 427-8466

PROJECT

FIRESTONE TIRE & RUBBER
COMPANY SITE
ALBANY, GEORGIA
ATEC PROJECT NO: 32-07-96-00067

6 2 0101



SOURCE: WOODWARD-CLYDE CONSULTANTS, REMEDIAL INVESTIGATION REPORT, 1992

PROJECT

FIRESTONE TIRE & RUBBER
COMPANY SITE
ALBANY, GEORGIA

ATEC PROJECT NO: 32-07-96-00067

ATEC Associates, Inc.

of Georgia
1300 Williams Drive
Marietta, Georgia 30066
(770)457-9456

LEGEND




INORGANICS OF INTEREST DETECTED
IN ROUNDS V AND VI:
RESIDUUM/TRANSITION ZONE WELLS

FIGURE 6.1

SCALE:

6 2 0105



	SURFACE WATER RUNOFF DITCH
	AERIAL ELECTRICAL LINES
	UNDERGROUND ELECTRICAL LINES
	FENCE LINE
	RAILROAD TRACKS

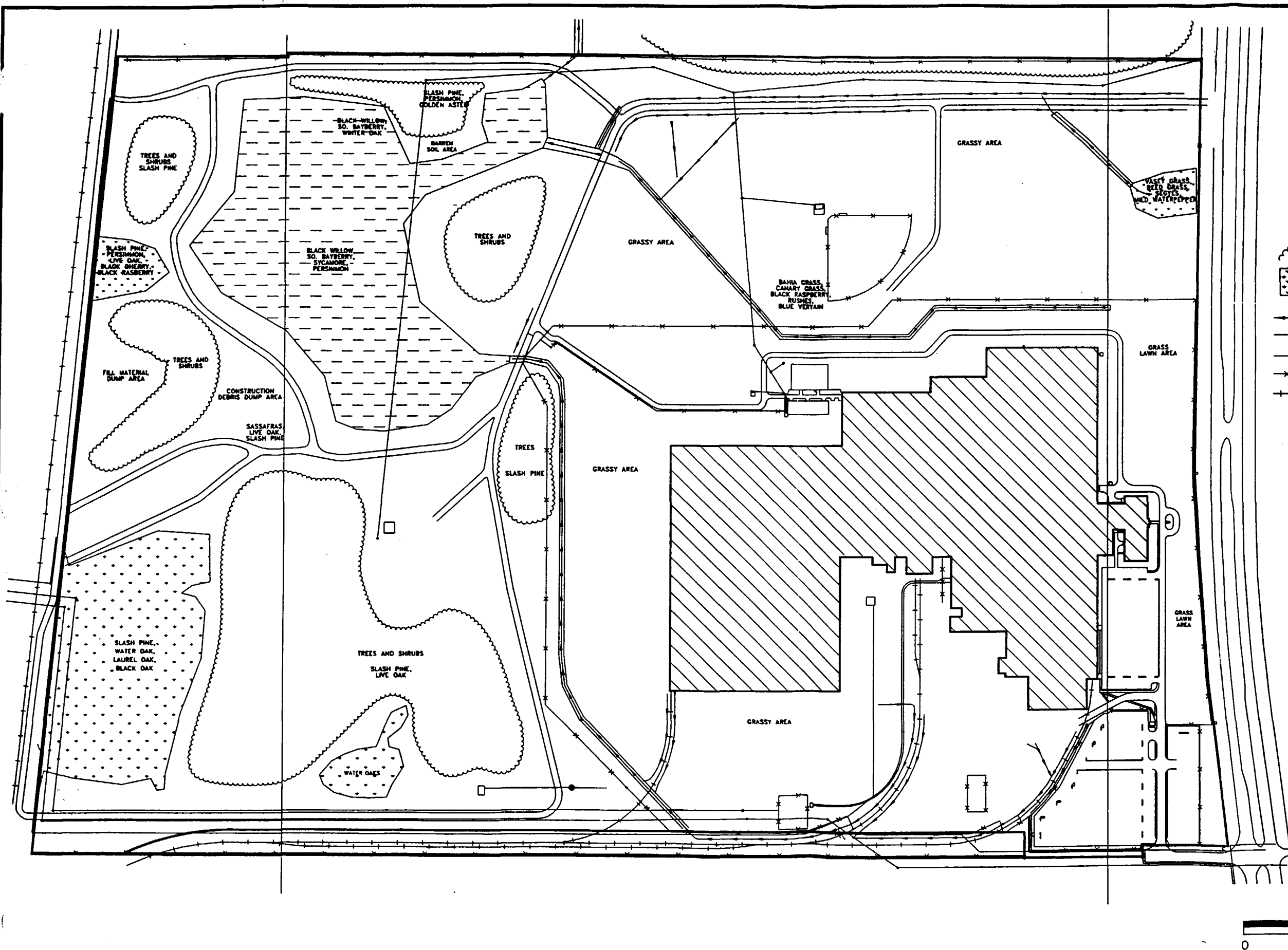
NOTE:
THE LOCATION OF DIRT
ROAD SYSTEM IN THE
SOUTHERN HALF OF THE
SITE IS APPROXIMATE.

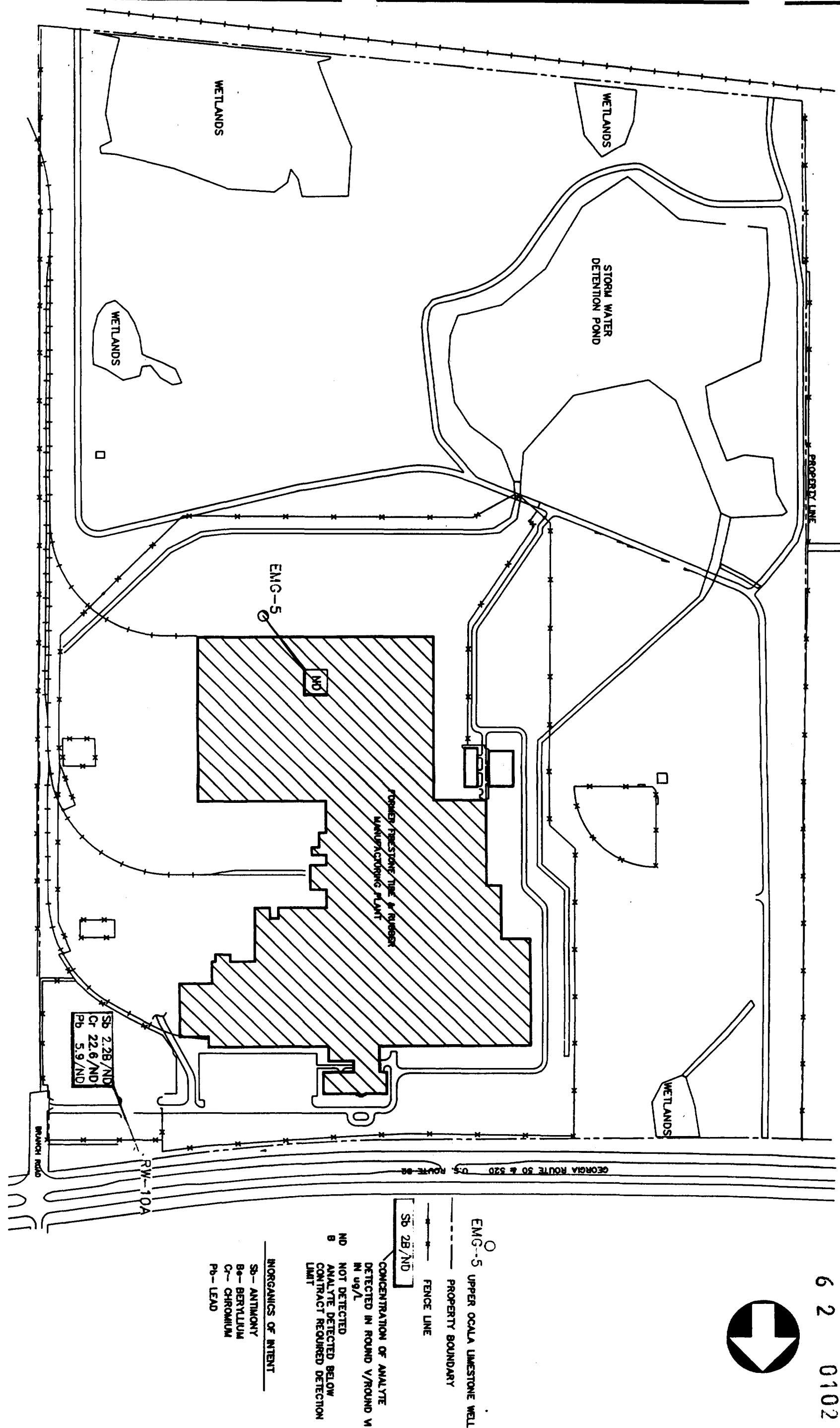
PROJECT
FIRESTONE TIRE & RUBBER COMPANY
COMPANY SITE
ALBANY, GEORGIA
ATEC PROJECT NO: 32-07-96-00067

ATEC Associates, Inc.
of Georgia
1300 Williams Drive
Marietta, Georgia 30068
(770)427-9456

LEGEND

SITE VEGETATION





SOURCE: WOODWARD-CLYDE CONSULTANTS, REMEDIAL INVESTIGATION REPORT, 1992

ATEC Associates, Inc.

of Georgia
1300 Williams Drive
Marietta, Georgia 30066
(770)427-9456

PROJECT

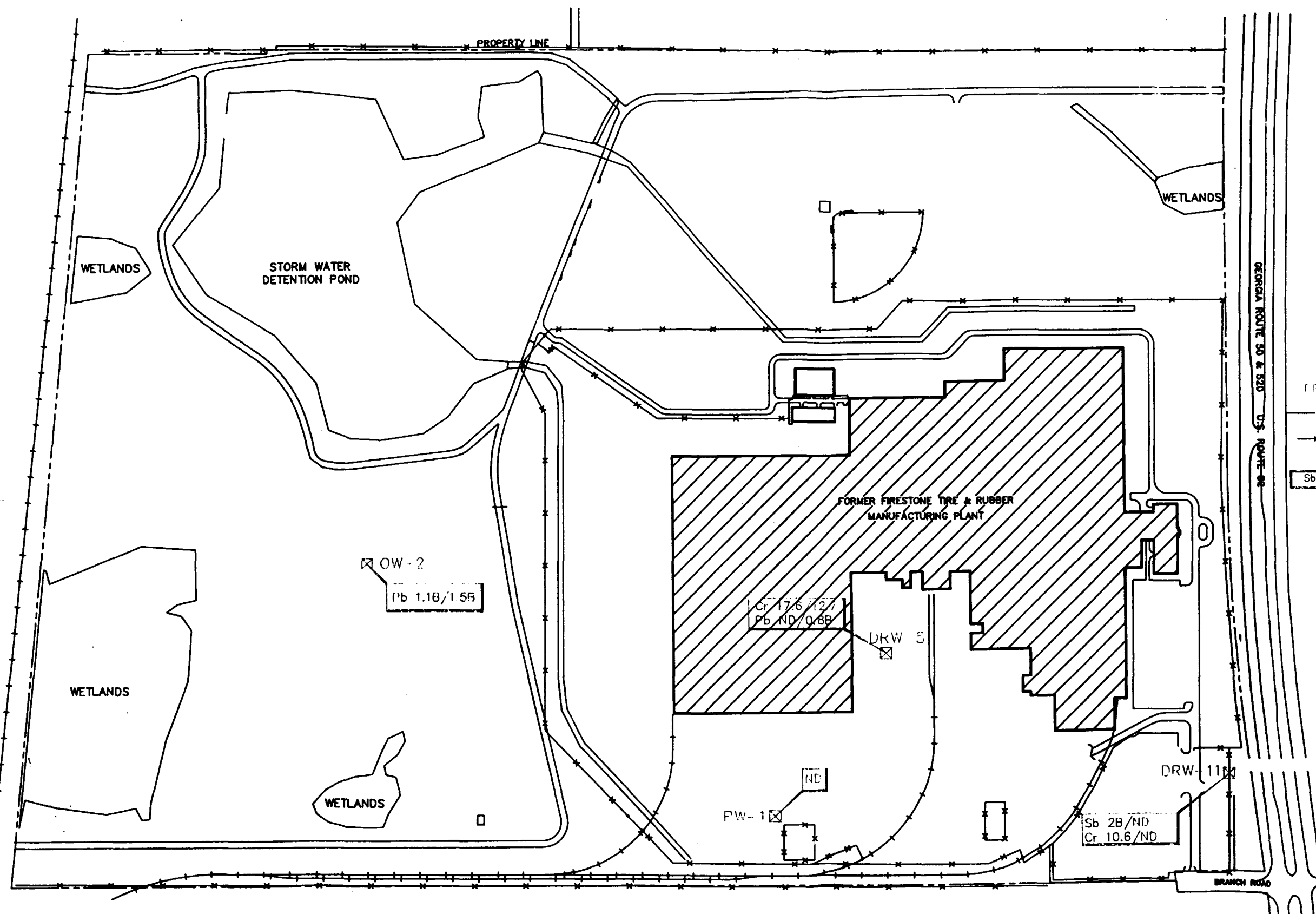
FIRESTONE TIRE & RUBBER
COMPANY SITE
ALBANY, GEORGIA
ATEC PROJECT NO: 32-07-96-00067

FIGURE 6.2

SCALE:

REFERENCE: 6/21/86 (104-1)

6 2 0103



LEGEND

- DRW-11 LOWER Ocala Limestone WELL
- PROPERTY BOUNDARY
- FENCE LINE
- Sb 2B/ND CONCENTRATION OF ANALYTE DETECTED IN ROUND V/ROUND VI IN ug/L
- ND NOT DETECTED
- B ANALYTE DETECTED BELOW CONTRACT REQUIRED DETECTION LIMIT
- INORGANICS OF INTENT**
 - Sb- ANTIMONY
 - Be- BERYLLIUM
 - Cr- CHROMIUM
 - Pb- LEAD

SCALE IN FEET



SOURCE: WOODWARD-CLYDE CONSULTANTS, REMEDIAL INVESTIGATION REPORT, 1992

PROJECT

FIRESTONE TIRE & RUBBER
COMPANY SITE
ALBANY, GEORGIA
ATEC PROJECT NO: 32-07-96-00067

ATEC Associates, Inc.

of Georgia
1300 Williams Drive
Marietta, Georgia 30066
(770)427-9456

REVISED: 9/21/95 (FIG-1)

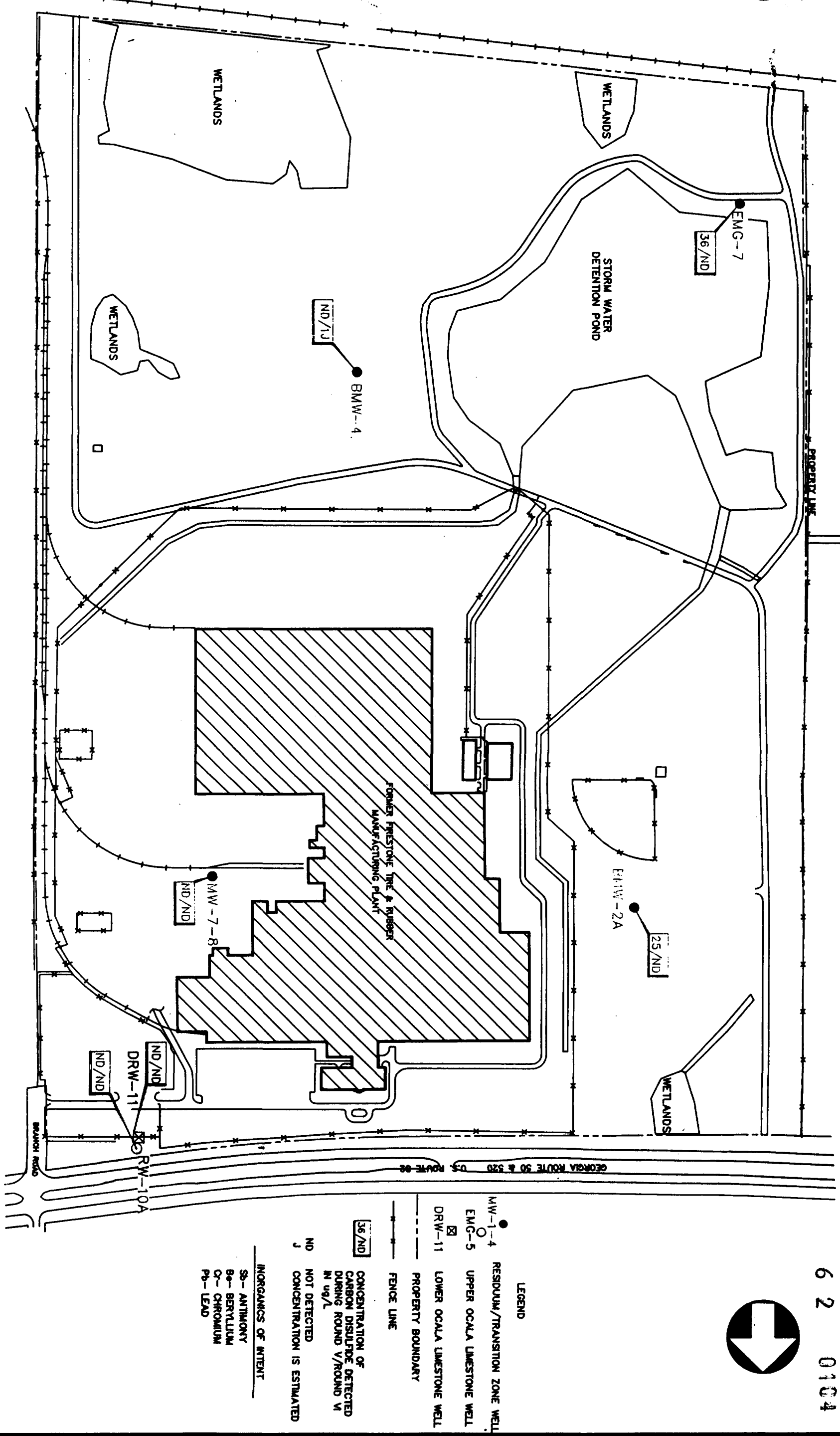
LEGEND

INORGANICS OF INTEREST DETECTED
IN ROUNDS V AND VI:
LOWER Ocala

FIGURE 6.3

SCALE:

6 2 0104



SOURCE: WOODWARD-CLOYE CONSULTANTS, REMEDIAL INVESTIGATION REPORT, 1992

LEGEND

CARBON DISULFIDE DETECTED DURING ROUND V AND VI

ATEC Associates, Inc.

of Georgia
1300 Williams Drive
Marietta, Georgia 30066
(770)427-0456

PROJECT

FIRESTONE TIRE & RUBBER
COMPANY SITE
ALBANY, GEORGIA
ATEC PROJECT NO: 32-07-96-00067

SCALE:

FIGURE 6.4

DATE: 9/27/95 (FIG-1)

6 2 0106

Appendices

**Technical Memorandum Report
for the
Inorganics Monitoring Study**

Firestone Tire and Rubber Company Site

APPENDIX A
FIELD PROCEDURES

TABLE OF CONTENTS

	<u>Page</u>
1.0 FIELD PROCEDURES	A-1
1.1 WELL CONDITION INSPECTION	A-1
1.2 MONITORING WELL ABANDONMENT PROCEDURES	A-3
1.3 DRILLING AND BOREHOLE TESTING PROCEDURES	A-3
1.3.1 Soil Borings	A-4
1.3.2 Mud Rotary Drilling	A-5
1.4 WELL INSTALLATION PROCEDURES	A-5
1.4.1 Type II Monitoring Well Installation Procedures	A-5
1.4.2 Type III Monitoring Well Installation Procedures	A-6
1.4.3 Well Development	A-6
1.5 SURVEY OF MONITORING WELLS	A-6
1.6 ENVIRONMENTAL SAMPLING ACTIVITIES	A-7
1.6.1 Water Level Measurements	A-8
1.6.2 Well Development Activities	A-8
1.6.3 Well Purging	A-9
1.6.4 Ground-Water Sample Collection	A-10
1.6.5 Sample Identification and Shipment	A-11
1.7 ANALYSIS OF GROUND-WATER SAMPLES	A-11
1.8 DECONTAMINATION PROCEDURES	A-12
1.8.1 Drilling Equipment	A-12
1.8.2 Sampling Equipment	A-13
2.0 SAMPLE CUSTODY	A-14
3.0 QUALITY CONTROL	A-15
3.1 FIELD QUALITY CONTROL SAMPLES	A-15
3.2 LABORATORY QUALITY CONTROL SAMPLES	A-16
4.0 REFERENCES	A-18

1.0 FIELD PROCEDURES

Well installation and environmental sample collection activities were conducted at the site during implementation of the Inorganics Monitoring Work Plan. This section presents procedures used during monitoring well abandonment, monitoring well installation, ground-water sampling, and other field procedures. The activities were performed in accordance with the following U.S. Environmental Protection Agency (USEPA) and project documents:

- *Standard Operating Procedures and Quality Assurance Manual* (USEPA, 1991)
- *RCRA Ground-Water Monitoring Technical Enforcement Guidance Document* (EPA, 1986a)
- *Contract Laboratory Program Statements of Work (CLP SOW)*, (USEPA, 1992 and 1993);
- *Handbook of Suggested Practices for the Design and Installation of Ground-Water Monitoring Wells* (USEPA, 1991);
- *Detailed Sampling and Analysis Plan* [Law Environmental, Inc. (LAW), 1995a]
- *Inorganics Monitoring Work Plan* (LAW, 1995b)
- *Field Sampling and Analysis Plan for Investigations of Firestone Tire & Rubber Company* [Woodward-Clyde Consultants (WCC), 1991a]
- *Quality Assurance Project Plan* (WCC, 1991b)

1.1 WELL CONDITION INSPECTION

Prior to implementation of the field activities, the condition of each monitoring well to be sampled was documented to evaluate the need for well repair or replacement. The results of this inspection indicated the following:

- The protective cover for well MW-1-2, located in the courtyard area, had been damaged (presumably due to traffic). Because the integrity of the

well appeared to be intact, the well was repaired by recompleting it as a flush-mount well.

- The cap for MW-1-5, a flush-mount well located in the courtyard area, was broken (presumably due to traffic). The flush-mount gasket for this well was not intact. Because the integrity of this well was suspect, the well was abandoned and reinstalled as well MW-1-5A.
- The protective cover and potentially the casing of well MW-1-6, located in the truck parking area, had been damaged (presumably due to traffic). This well was abandoned and reinstalled as MW-1-6A.
- Wells MW-9-1 and MW-9-2 had been damaged during construction of a railroad spur. Because these wells were historically dry, the wells were abandoned.
- The water level in well EMG-5A, the Residuum well in a two well cluster (with EMG-5), has historically been approximately one foot above the bottom of the end cap. Conditions observed during February 1995 confirmed this ground-water level. Due to the inability of this well to produce sufficient ground water for representative sampling, the well was abandoned. A boring was drilled adjacent to the EMG-5A in an effort to reinstall the well in a more productive zone in the Residuum. Because no significant water bearing zone was encountered to a depth of approximately 40 feet in the Residuum and well EMG-5 already provides a deeper monitoring point at this location, no well was installed.
- The casing for well BMW-2 was not intact below ground surface. This well was abandoned and reinstalled as well BMW-2A.
- As described in the IMWP, well RW-10 was abandoned. A replacement well (RW-10A) was located outside the facility fenceline as far upgradient from RW-10 as utilities permitted.

Detailed well abandonment and installation procedures are described below. In addition to the conditions at specific wells described above, the majority of Residuum, Transition Zone and Upper Ocala wells were observed to contain a significant layer of sediment at the bottom of the wells. Because of the ubiquitous presence of sediments, these wells were redeveloped prior to purging and sampling. Development procedures are provided in Section 1.6.2.

1.2 MONITORING WELL ABANDONMENT PROCEDURES

Monitoring wells MW-1-5, MW-1-6, MW-9-1, MW-9-2, EMG-5A, BMW-2 and RW-10 were abandoned by removing the well pad/protective cover, overdrilling the well casing using hollow stem augers, removing the well casings, and grouting the boreholes with a cement-bentonite mix. The well pad for wells RW-10, BMW-2, MW-1-5, MW-1-6, and EMG-5A were removed by manually breaking-up the cement with a jackhammer. The well pads for wells MW-9-1 and MW-9-2 were not intact at the time of field activities.

Single-cased wells MW-9-1, MW-9-2, BMW-2, MW-1-5, MW-1-6, and EMG-5A were abandoned by overdrilling using a 8-inch outside-diameter (O.D.), 5.5-inch inside-diameter (I.D.) hollow-stem auger to the depth of the bottom of the well casing. The well casing was removed from the borehole and disposed.

Double-cased well RW-10A was overdrilled using 12-inch O.D., 10-inch I.D. hollow stem augers. The outer casing of well RW-10 was removed; however, after several attempts, the drilling contractor was unable to remove the inner well casing. With the concurrence of USEPA oversight personnel and Georgia Environmental Protection Division (Georgia EPD) representatives, the uppermost section of steel well casing in well RW-10 was unscrewed and the remaining casing was grouted in place.

A ground-water recovery sump that was never used, located in the former burn pit area, was removed during field activities by pulling the sump pipe from the ground and filling the resulting hole with a bentonite-cement mixture.

The boreholes were filled using a lean bentonite-cement mixture to within approximately 2 feet of the ground surface. The remaining two feet were filled with a concrete plug.

1.3 DRILLING AND BOREHOLE TESTING PROCEDURES

1.3.1 Soil Borings

Five soil borings were drilled during site activities to further characterize soil and hydrogeologic conditions and to install monitoring wells. Soil borings were advanced by a truck-mounted drill rig using continuous-flight hollow-stem auger drilling methods. Boreholes for monitoring wells BMW-2A, MW-1-5A, MW-1-6A, EMG-5A and RW-10A were drilled in locations where existing wells were abandoned. Drilling and sampling procedures consisted of Standard Penetration Tests conducted in accordance with the American Society for Testing and Materials (ASTM) Specification D1586-84 (1984). Soil samples were collected at five-foot intervals until boring termination using a 1.4-inch inside-diameter (I.D.), 2-inch outside-diameter (O.D.) split-spoon sampler. The sampler was seated six inches to penetrate loose cuttings and then driven an additional foot by a 140-pound hammer falling 30-inches. The number of hammer blows required to drive the sampler the final foot was recorded as the standard penetration resistance. The field geologist completed a lithologic log for each boring based on a visual review of the split-spoon samples and soil cuttings. The lithology was recorded on a Soil Test Boring Record.

Soil borings for wells BMW-2A, MW-1-5A, and MW-1-6A, which are screened in the Residuum, were drilled to depths of 20 feet, 62 feet, and 40 feet, respectively, which are comparable to the associated abandoned monitoring wells. The borehole for RW-10A, which is screened in competent rock of the Upper Ocala, was drilled to a depth of 42.5 feet to the top of bedrock.

Soil samples from borings BMW-2A, MW-1-5A, MW-1-6A were placed in clean 250-ml glass jars, sealed with aluminum foil, and capped with a lid. After allowing the soil samples to equilibrate for a minimum of 15 minutes, the headspace was analyzed for the presence of volatile organic vapors by inserting the probe of an organic vapor detector (OVD) through the foil. This screening was conducted to evaluate the presence of volatile organics within the vadose zone. No organic vapors were detected during drilling activities.

One soil boring was drilled adjacent to well EMG-5A in an attempt to construct a well which would yield sufficient ground water for sampling. The borehole was advanced to 30 feet and allowed to recover overnight. When no ground water was recovered after 12 hours, the borehole was advanced an additional 10 feet. After sufficient time was allowed for recovery, and no ground water was observed, the borehole was grouted as described above.

Drilling and soil sampling equipment was decontaminated before introduction into the borehole. The soil sampling equipment was decontaminated between each sample. Decontamination procedures are discussed in Section 1.7 of this appendix.

1.3.2 Mud Rotary Drilling

The inner borehole for double-cased (Type III) monitoring well RW-10A was drilled using mud rotary drilling techniques. A 5 ⁷/₈-inch tricone bit was used to advance the borehole inside the grouted outer casing and approximately 20 feet into bedrock. Drill cuttings were removed by circulating a bentonite/water mixture through the borehole while drilling. Upon termination of drilling, the borehole was completed as a Type III well as described in Section 1.4.2.

1.4 WELL INSTALLATION PROCEDURES

Three Type II (BMW-2A, MW-1-5A, and MW-1-6A) ground-water monitoring wells and one Type III (RW-10A) ground-water monitoring well were installed in the boreholes drilled at the site.

1.4.1 Type II Monitoring Well Installation Procedures

Type II monitoring wells (BMW-2A, MW-1-5A, and MW-1-6A) were installed in the boreholes discussed in Section 1.3.1. The wells were constructed using ten feet of machine slotted, 2-inch I.D. Schedule-40 PVC well screen (0.010 slot size) with 2-inch I.D. Schedule 40 PVC riser. Each well was fitted with an endpipe. The annular space around the well screen was filled 1 to 5 linear feet above the top of the screen with clean 20-40 sand. Bentonite pellets were placed over the sand filter pack 1.7 to 2.5 linear feet and hydrated with potable water. The remaining annulus was grouted to the ground surface with a cement/bentonite slurry. A lockable protective cap was placed on each monitoring well. Well BMW-2A was completed as a stick-up well; wells MW-1-5A and MW-1-6A were completed as flush-mount wells.

1.4.2 Type III Monitoring Well Installation Procedures

The 6-inch I.D. outer casing for Type III monitoring well RW-10A was placed to the top of the competent rock following completion of the soil boring. The casing was sealed and grouted to the land surface. The grout inside the outer casing was reamed out using mud rotary techniques. The borehole was then drilled to the final boring depth (approximately 62 feet) using mud-rotary techniques. Ten feet of machine slotted, 2-inch I.D. Schedule 40 PVC well screen (0.010 slot-size) with 2-inch I.D. Schedule 40 PVC riser was installed into the borehole. The well was fitted with an endpipe. The annular space around the well screen was filled approximately 5 linear feet above the top of the screen with clean 20-40 sand. Approximately 7 feet of bentonite pellets were placed over the sand filter pack and hydrated with potable water. The remaining annulus was grouted to the ground surface with a cement/bentonite slurry. A lockable protective cap was installed over the monitoring well. Well MW-10A was completed as a flush-mount well.

1.4.3 Well Development

The monitoring and recovery wells was developed using surge block and bailing methods. Bailing techniques involve removing sediment and ground water from the well using either a PVC or Teflon™ bailer attached to a nylon rope. Development was terminated when the ground water appeared to be relatively free of suspended sediment and the pH, temperature and specific conductance measurements of the ground water had stabilized. Approximately five times the well volume of ground water was remove during development. Well development water was retained for characterization and subsequently discharged via the permitted POTW outfall. Materials used in the well development process were decontaminated in accordance with procedures described in Section 1.8.

1.5 SURVEY OF MONITORING WELLS

Monitoring well elevations and locations were surveyed by Marbury Engineering, a Georgia-registered land surveyor using standard surveying procedures. The top of the casing was marked (generally on the north side) to identify the surveyed point for subsequent ground-water level measurement. Monitoring well elevations were surveyed to an accuracy of 0.01 foot; well locations were surveyed to an accuracy of 0.1 foot.

1.6 ENVIRONMENTAL SAMPLING ACTIVITIES

Field personnel responsible for environmental sampling verified that necessary equipment for obtaining ground-water samples at the site was available. A routine equipment check was performed that included the following:

1. Meters, probes, standards and other field measurement equipment
2. Filtration equipment
3. Appropriate sample containers with labels
4. Applicable field and trip blanks
5. Sample shippers or coolers
6. Bagged ice, when applicable
7. Graduated steel tape and chalk or electronic water level indicator
8. Field book and indelible ink marker
9. Appropriate field sampling record forms
10. Chain of Custody forms
11. Well evacuation equipment
12. Teflon™ bailers
13. Cleaning and decontamination solutions, distilled water, and decontamination equipment, including buckets and scrub brushes and plastic sheeting
14. Other necessary equipment, such as monitoring well keys, tools, camera, calculator.

Ground-water samples were collected from the monitoring wells for laboratory analysis in accordance with the field procedures discussed below.

1.6.1 Water Level Measurements

Prior to well purging and ground-water sampling, the depth to ground water and total well depth from the top of well casing was measured. Water levels were measured from an established measuring point marked on top of the well casing (see Section 1.5). Water level measurements were obtained using an electric water level indicator or a chalked, graduated steel tape. When using an electronic water level indicator, the probe was inserted into the well and lowered to the ground-water surface. The depth to ground water, relative to the measuring point, was determined from the electronic indicator. This value was subtracted from the measuring point elevation to record the ground-water elevation to the nearest 0.01 foot.

When using a chalked steel tape, the weighted end of the tape was inserted into the well and lowered until the chalked portion of the tape is below the ground-water surface. The "held" measurement of the tape at the measuring point was recorded. The tape was removed from the well and the "wet" measurement recorded. The depth to ground water below the measuring point was determined by subtracting the "wet" measurement from the "held" measurement. This value was subtracted from the elevation of the measuring point to find the elevation of the ground-water surface to the nearest 0.01 foot. All measurements and calculations were recorded in a bound, water-resistant field notebook.

The steel or electronic tape was cleaned with distilled water, and pesticide-grade isopropanol and wiped dry before measuring ground-water levels in each well.

1.6.2 Well Development Activities

The Residuuum, Transition Zone, and Upper Ocala wells that were to be sampled were developed prior to purging and sampling by removing approximately five well volumes of ground water with a bailer. During development, the bailer was moved rapidly through the water column in an attempt to evacuate sediments from the well. Wells were allowed to recover a minimum of 24 hours after development before purging activities were initiated. Lower Ocala wells were not redeveloped prior to purging and sampling because the sediments in these wells were not expected to be disturbed during low-flow pumping.

1.6.3 Well Purging

As described in the Inorganics Monitoring Work Plan, various purging and sampling techniques were available for use during this study. After experimentation using several purging methods, the combination of techniques eventually employed for purging and sampling was selected to limit the measured and observed turbidity in ground-water samples. This section contains a narrative of conditions observed during purging and sampling activities.

The first purging technique employed the use of bladder pumps in well RW-3. The intake of the bladder pump was lowered to within two feet of the top of the well screen. The pumping rate was stabilized at a rate approximately equal to the well recovery rate. The ground-water level was measured continuously during pumping with an electronic water level tape. After approximately 1.5 hours of purging, visual turbidity levels were increasing, apparently due to surging from the pump charge/discharge cycle. Based on the turbidity levels observed, the purging technique using bladder pumps was abandoned.

The second purging technique employed the use of a submersible pump at low flow rates similar to those described above. The intake of the submersible pump was lowered to within two feet of the top of the well screen. The pumping rate was stabilized at a rate approximately equal to the well recovery rate. The ground-water level was measured continuously during pumping with an electronic water level tape. Turbidity visually decreased while purging. After approximately 1.5 hours of purging, the purge water was visually clear. This method was subsequently used for purging the remaining wells with similar results.

With the exception of PW-1, all of the wells that were sampled were purged using a submersible pump at low sustained flow in higher yield wells or by cycling the pump (over relatively long periods of time) in lower yield wells. In most cases, after 1 to 4 hours of purging, the ground-water quality parameters (pH, specific conductance, temperature, and turbidity) had stabilized, and the purged ground water was observed to be clear. After removing approximately 50 gallons of ground-water from wells MW-1-6A and MW-1-5A, the purged ground water remained turbid. Ground-water quality parameters in the wells, however, had stabilized and the purging was deemed complete. As discussed with USEPA on March 2, 1995 and confirmed in the letter from LAW

to USEPA, dated March 6, 1995, those wells that after purging did not produce clear ground water were allowed to recover beyond the 90% recovery level prior to sampling for inorganics.

Well PW-1, which is fitted with a permanent pump, was evacuated for approximately 10 minutes prior to sample collection. Well PW-1 pumps water at an approximate rate of 1000 gallons per minute.

When purging was considered complete, the pump was slowly and gently removed from the well. Table 5.2 of the TMR lists the values of the water quality parameters for the wells at the end of purging.

1.6.4 Ground-Water Sample Collection

After the well had been allowed a sufficient time to recover (based on recovery rates noted during purging), the samples were collected using laboratory-cleaned Teflon® bailers. For cases in which a well was purged in the morning, the sample was collected later that afternoon. For cases in which the well was purged in the afternoon, the sample for carbon disulfide (CS₂) analysis was collected on the same day (once the well had recovered to at least 90% of the pre-purged ground-water level), and the samples for metals analysis were collected the following morning. During collection of samples for metals analysis, the unfiltered sample was collected first by pouring the ground water from the bailer directly into 40-milliliter glass vials for CS₂ analysis and 1-liter plastic containers for metals analysis. Samples collected for CS₂ analysis were observed for the presence of air bubbles which would allow headspace volatilization. No head space was observed by field or laboratory personnel within the 40-ml vials after they were sealed. Filtered samples were collected after the unfiltered sample by pouring the ground water from the bailer directly into the 0.45-micron filtration apparatus. After filtering, the filtered sample was preserved by pouring the water into the pre-preserved sample container. Samples obtained from the first bailer for analysis of unfiltered metals were visually clear, including the samples collected from wells which exhibited high levels of turbidity during purging (ie., MW-1-6A and MW-1-5A during Round V). The successive bailers collected (if necessary) often exhibited higher levels of turbidity prior to filtration due to agitation of the water column during collection of the unfiltered sample. At the request of USEPA, one aliquot of ground water was collected to obtain a turbidity reading after

all samples were collected. Turbidity was read using an HF Scientific 15C Portable Turbidity Meter.

Sample containers were supplied by the analytical laboratory and contained HCl as a preservative for CS₂ analysis and HNO₃ as a preservative for metals analysis. The containers were placed on ice in a shipping container for storage prior to overnight delivery to the laboratory.

Because a sufficient number of laboratory cleaned Teflon™ bailers for each sample collected, bailers did not require cleaning between sampling events. After sample collection the bailers were cleaned to remove potential contamination prior to return to the laboratory.

1.6.5 Sample Identification and Shipment

All samples were labeled in a clear and consistent fashion. Each sample container was identified by affixing a water-proof, adhesive label on the container. The label information included the sample identification number, date and time of sample collection, source of sample, preservatives used, and the collector's initials. The label was completed with water-proof ink. This information was also recorded in a bound, water-resistant field book and on the Field Sampling Report form.

Chain of Custody Records included with the sample shippers/coolers were also completed to establish a tracking record for the samples and to provide historical documentation. After the samples are collected and stored in a cooler with ice, the field sampling personnel signed the Chain of Custody Record in preparation for shipment of the samples to the laboratory.

The samples were shipped from the sampling site to the laboratory the same day as sample collection or as soon as possible thereafter. Timely shipment was necessary so samples would meet the EPA recommended holding times. The shipping container was designed to prevent breakage, spillage and contamination of the samples and was securely sealed and clearly labeled.

1.7 ANALYSIS OF GROUND-WATER SAMPLES

Ground-water samples were packaged and shipped following chain-of-custody procedures to Quanterra Laboratories in Pittsburgh, Pennsylvania. Ground-water samples were analyzed

following CLP SOWs (USEPA, 1992 and USEPA, 1993) for CS₂ and antimony, beryllium, chromium, and lead.

1.8 DECONTAMINATION PROCEDURES

Decontamination procedures were employed during field activities and laboratory analyses to reduce the possibility of cross-contamination. Decontamination procedures for drilling and field sampling equipment and sample containers are provided in the following sections.

1.8.1 Drilling Equipment

Prior to conducting drilling activities at each sampling location, the following field equipment was steam-cleaned:

- drill rods and augers
- sampling devices and drill bits
- mud tub and exterior of hoses (hose interiors was flushed with potable water)
- pipe wrenches and tools that come in contact with downhole materials
- working end of drill rig
- well construction materials, inside and out.

Appropriate materials, equipment and transport vehicles were steam cleaned before arriving and before leaving the site. Sampling equipment was washed between sample collection activities using phosphate-free detergent and thoroughly rinsed with potable water. No form of lubrication was applied to drill rod threads. The use of rig lubricants and fuels was closely monitored to avoid their introduction into the borehole.

1.8.2 Sampling Equipment

Teflon™ bailers, stainless steel submersible pumps, and polyethylene tubing were cleaned in the field as follows:

1. Wash with Alconox and a brush
2. Rinse thoroughly with tap water
3. Rinse thoroughly with deionized water
4. Rinse with pesticide-grade isopropanol
5. Allow to air dry and then wrap in aluminum foil.

Pumps and polyethylene tubing were decontaminated after each purging episode to reduce possible cross-contamination between sample locations. Bailers were cleaned after each use, prior to return to the laboratory. Bailers were not used in more than one well.

2.0 SAMPLE CUSTODY

Sample custody documentation was initiated at the time of sample collection. Detailed documentation of sampling procedures and sample identification was recorded during sampling in a bound, water-resistant field notebook. All sample containers had sample labels completed with indelible ink.

In order to document sample possession from time of collection to time of sample receipt by the laboratory, a Chain-of-Custody form was maintained for each sample set. The Chain-of-Custody form included site name, sampler's names and signatures, time and date of sample collection, sample identification, requested analysis, and container type. The Chain-of-Custody form was placed in a plastic bag, secured inside the sample shipping container and accompanied the sample shipment to the laboratory. Individuals relinquishing and receiving the sample signed, dated, and noted the time on the Chain-of-Custody form. Chain-of-Custody seals, signed and dated by the field representative, and packing tape was used to seal the shipping container. Chain-of-custody procedures generally follow those described in the USEPA Region IV *Standard Operating Procedure and Quality Assurance Manual* (USEPA, 1991). Shipping records and airbills also provide means of tracking the sample shipment and was retained as part of the chain-of-custody documentation. Airbill numbers for each shipping container was recorded on the Chain-of-Custody form.

3.0 QUALITY CONTROL

Quality control (QC) samples were collected and analyzed as part of the Quality Assurance (QA) Program discussed in the Inorganics Monitoring Work Plan. QC samples were generated in the field and laboratory and are discussed in the following sections.

3.1 FIELD QUALITY CONTROL SAMPLES

Field QC samples collected during Rounds V and VI included rinsate blanks, trip blanks, field blanks, duplicate samples, and matrix spike/matrix spike duplicate samples.

Rinsate Blanks

One rinsate blank was collected during Round V and Round VI to evaluate the decontamination of the laboratory-cleaned Teflon™ bailers used for sample collection. Prior to use in a well, rope was attached to a bailer and the bailer was filled with deionized water. The water was poured directly into sample containers from the bailer. One aliquot of the deionized water was poured directly from the bailer into a filtration apparatus for each round of sampling. The rinsate blanks were analyzed for CS₂ and filtered and unfiltered metals.

Trip Blanks

One trip blank was included in every shipper containing samples for CS₂ analysis to evaluate the potential impact of storage and handling of the sample containers and, subsequently, the samples prior to analysis. Trip blanks were prepared by the laboratory and accompanied the sample containers from the laboratory to the site and the samples from the site to the laboratory. The trip blanks were stored with the samples in the laboratory until analysis. The trip blanks were analyzed for CS₂.

Field Blanks

Field blanks were collected at every location that a sample for CS₂ analysis was collected to evaluate the ambient conditions during sample collection and during sample handling and analytical

procedures. Field blanks were prepared by pouring deionized water into open sample containers before the environmental sample was collected. After the environmental sample was collected, the field blank sample containers were sealed. All of the field blanks were analyzed for CS₂; one field blank per sampling round was analyzed for unfiltered metals.

Duplicate Samples

Duplicate samples were collected during Rounds V and VI to evaluate the sampling and analytical reproducibility. The duplicate sample was collected by filling two sets of sample containers with ground water from the same bailer(s). One of the duplicated samples was labeled with the sample location; the second duplicated sample was labelled with a fictitious sample location. Two field duplicates were collected per sampling round for filtered and unfiltered metals analysis, resulting in a frequency of one duplicate for every 9.5 samples. One field sample was collected per sampling round for CS₂ analysis, resulting in one duplicate for every 6 samples.

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike/matrix spike duplicate (MS/MSD) samples were collected during Rounds V and VI to evaluate the potential impact of sample matrix interferences on analytical precision and accuracy. The MS/MSD samples were collected by filling two additional sets of sample containers with ground-water from the same bailer. One MS/MSD was analyzed per sampling round for CS₂, filtered and unfiltered metals analysis, resulting in a frequency of one MS/MSD for every six samples for CS₂ analysis and one MS/MSD in every nineteen for filtered and unfiltered metals analysis.

3.2 LABORATORY QUALITY CONTROL SAMPLES

Laboratory QC samples were analyzed in accordance with the CLP SOWs and include method blanks, continuing calibration blanks and preparatory blanks.

Method Blanks

Method blanks are analyzed during analysis of volatile organic compounds after instrument calibration and before sample analysis to evaluate ambient conditions in the laboratory. Method blanks were analyzed at the frequency specified in the SOW.

Continuing Calibration Blanks

Continuing calibration blanks are analyzed during analysis of metals after instrument calibration and before sample analysis to evaluate ambient conditions in the laboratory. Method blanks were analyzed at the frequency specified in the SOW.

Preparation Blanks

Preparation blanks accompany environmental samples through the preparation, handling, storage, and analytical procedures and are analyzed for metals to evaluate ambient conditions in the laboratory. Method blanks were analyzed at the frequency specified in the SOW.

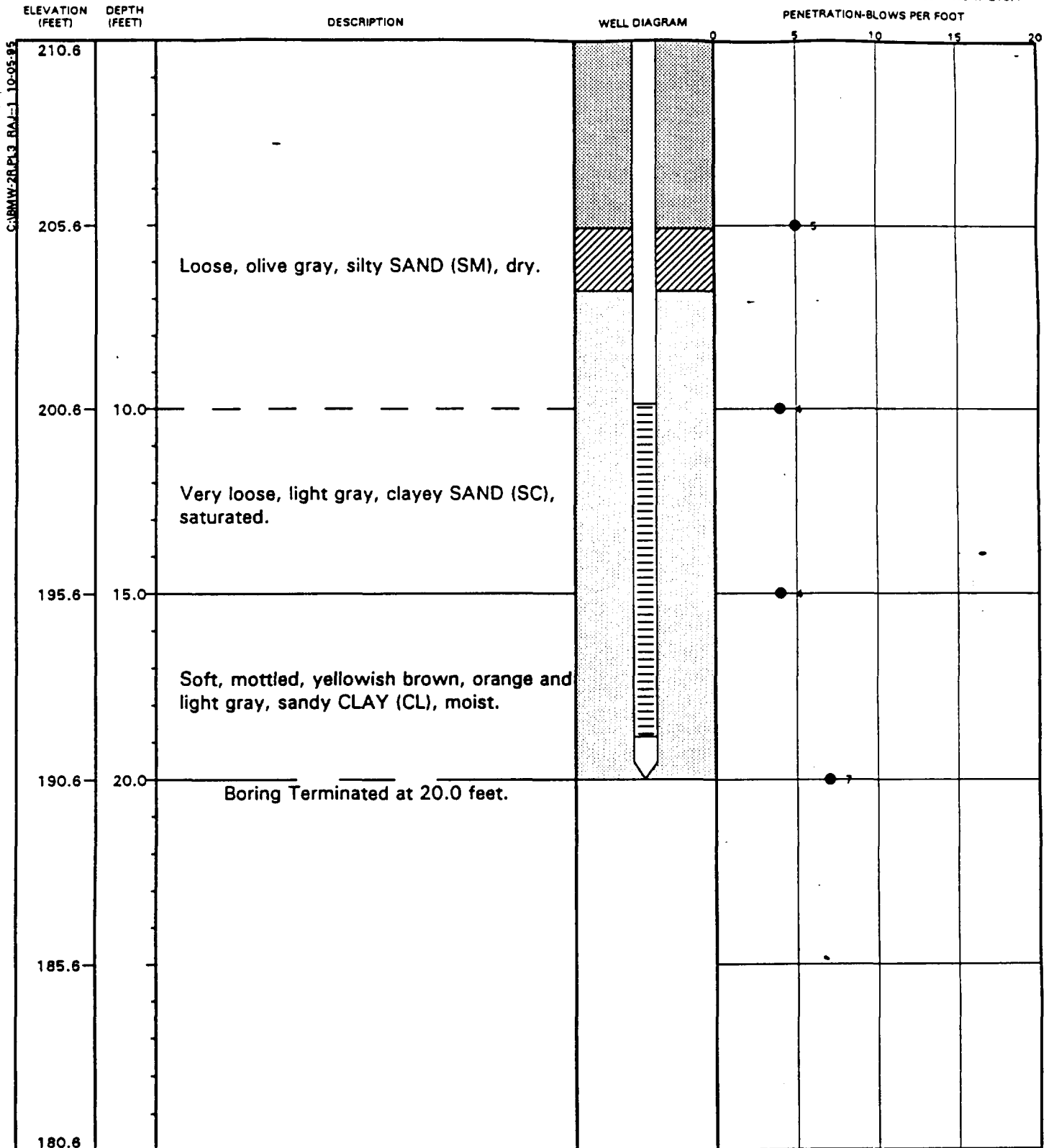
4.0 REFERENCES

- American Standards for Testing and Materials Committee, 1984. *Annual Book of ASTM Standards*, Vol. 04.08.
- Law Environmental, Inc., 1995a. *Detailed Sampling and Analysis Plan, Firestone Tire & Rubber Site, Albany, Georgia*, Kennesaw, Georgia, 1995.
- Law Environmental, Inc., 1995b. *Inorganics Monitoring Work Plan, Firestone Tire & Rubber Site, Albany, Georgia*, Kennesaw, Georgia, 1995.
- United States Environmental Protection Agency, 1986a. *RCRA Ground-Water Monitoring Technical Enforcement Guidance Document*. Office of Solid Waste and Emergency Response; September, 1986.
- United States Environmental Protection Agency, 1986b. *Test Methods for Evaluating Solid Waste*, Third Edition, EPA/SW-846, Office of Solid Waste and Emergency Response; November, 1986.
- United States Environmental Protection Agency, 1991. *Handbook of Suggested Practices for the Design and Installation of Ground-Water Monitoring Wells*, EPA/600/4-89/034. Office of Research and Development, Washington, D.C.; March 1991.
- United States Environmental Protection Agency, 1992. *Contract Laboratory Program Statement of Work for Organics Analysis*, OLM01.8, Sample Management Office, Cincinnati, Ohio.
- United States Environmental Protection Agency, 1993 *Contract Laboratory Program Statement of Work for Inorganics Analysis*, ILM03.0, Sample Management Office, Cincinnati, Ohio.
- Woodward-Clyde Consultants, 1991a. *Field Sampling and Analysis Plan for Investigations of Firestone Tire & Rubber Company, Former Firestone Rubber & Tire Facility, Albany, Georgia*. Chicago, Illinois, 1991.
- Woodward-Clyde Consultants, 1991b. *Quality Assurance Project Plan*, Albany, Georgia, Chicago, Illinois, 1991.

APPENDIX B
BORING LOGS/MONITORING WELL INSTALLATION DIAGRAMS

TEST BORING RECORD

6 2 0128

HEIGHT OF RISER: 2.85
DATUM ELEVATION: 213.4

REMARKS:

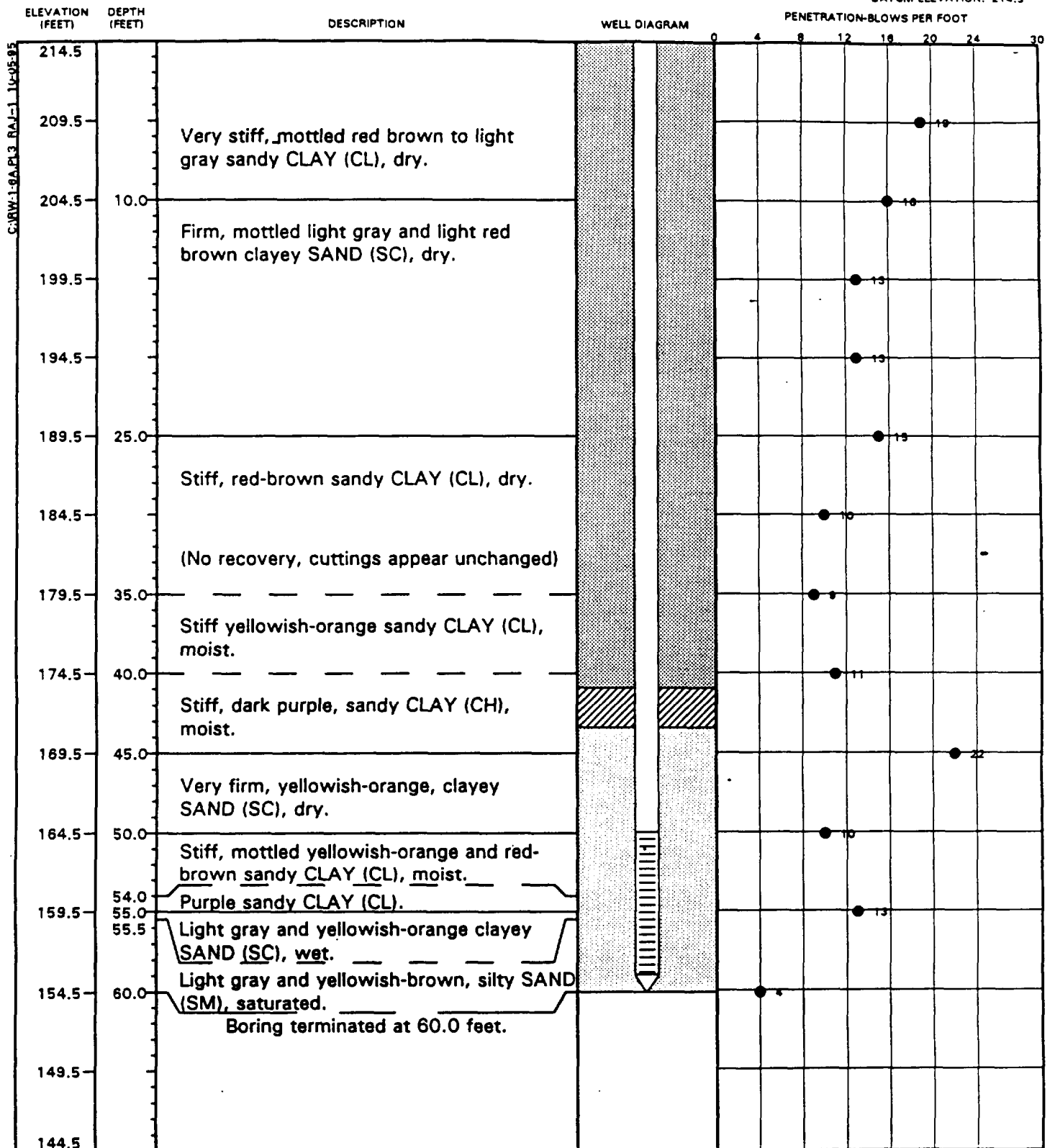
- 1) Boring advanced to 20 feet using 4 1/4" I.D. hollow stem augers and split barrel sampler.

DRILLED BY R.B.
LOGGED BY T.M.
CHECKED BY J.M.
APPROVED BY E.S.

BORING NUMBER BMW-2A
DATE STARTED 3/9/95
DATE COMPLETED 3/9/95
JOB NUMBER 41-4515

TEST BORING RECORD

6 2 0129

HEIGHT OF RISER: -0.1
DATUM ELEVATION: 214.5

REMARKS:

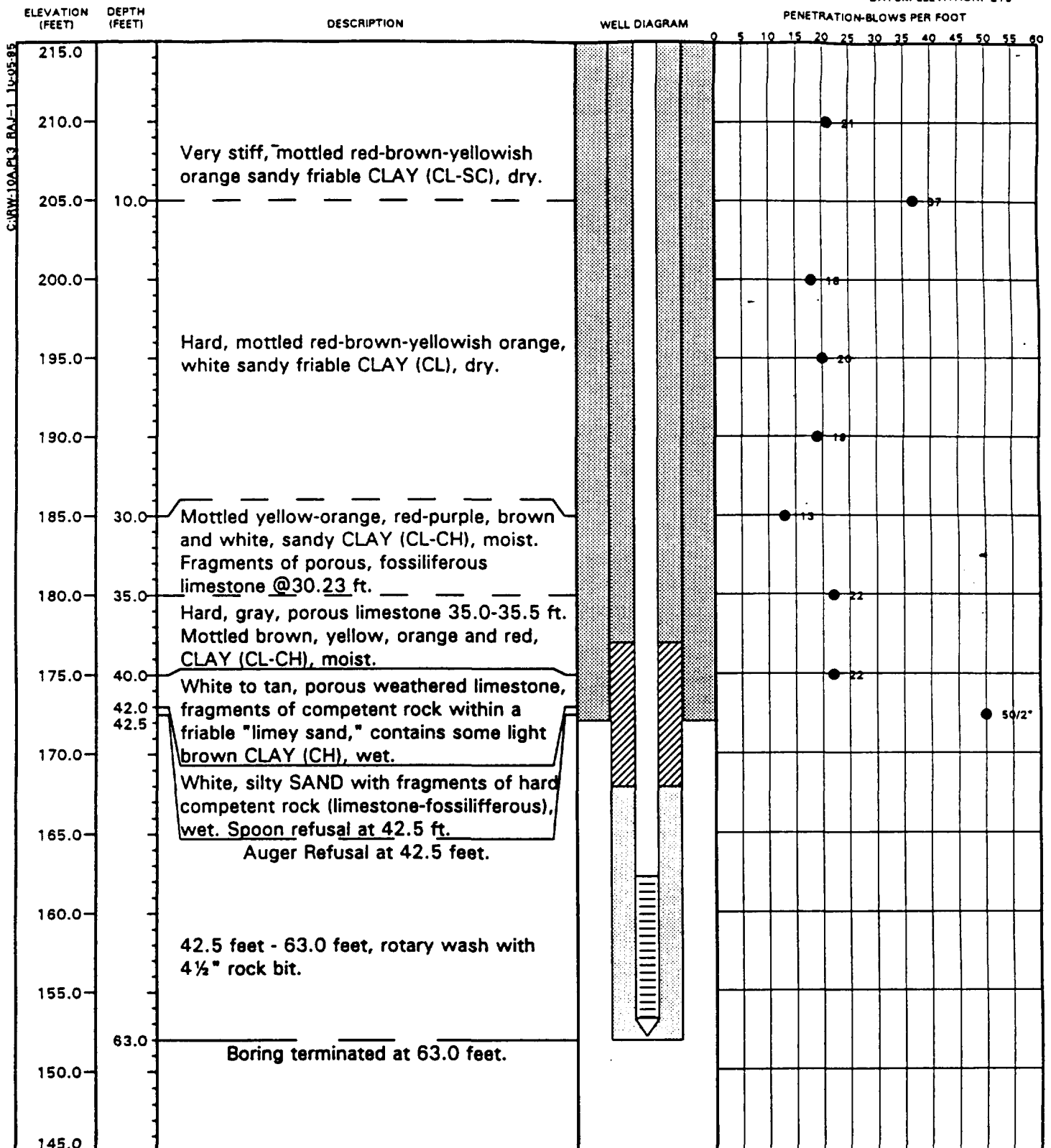
- 1) Boring advanced to 60 feet using 4 1/4" I.D. hollow stem augers and split barrel sampler.

DRILLED BY R.B.
LOGGED BY T.M.
CHECKED BY J.M.
APPROVED BY E.S.

BORING NUMBER MW-1-6A
DATE STARTED 3/8/95
DATE COMPLETED 3/8/95
JOB NUMBER 41-4515

TEST BORING RECORD

6 2 0130

HEIGHT OF RISER: -0.2
DATUM ELEVATION: 215

REMARKS:

1) Boring advanced to 42.5 feet using 4 1/4" I.D. hollow stem augers and split barrel sampler.

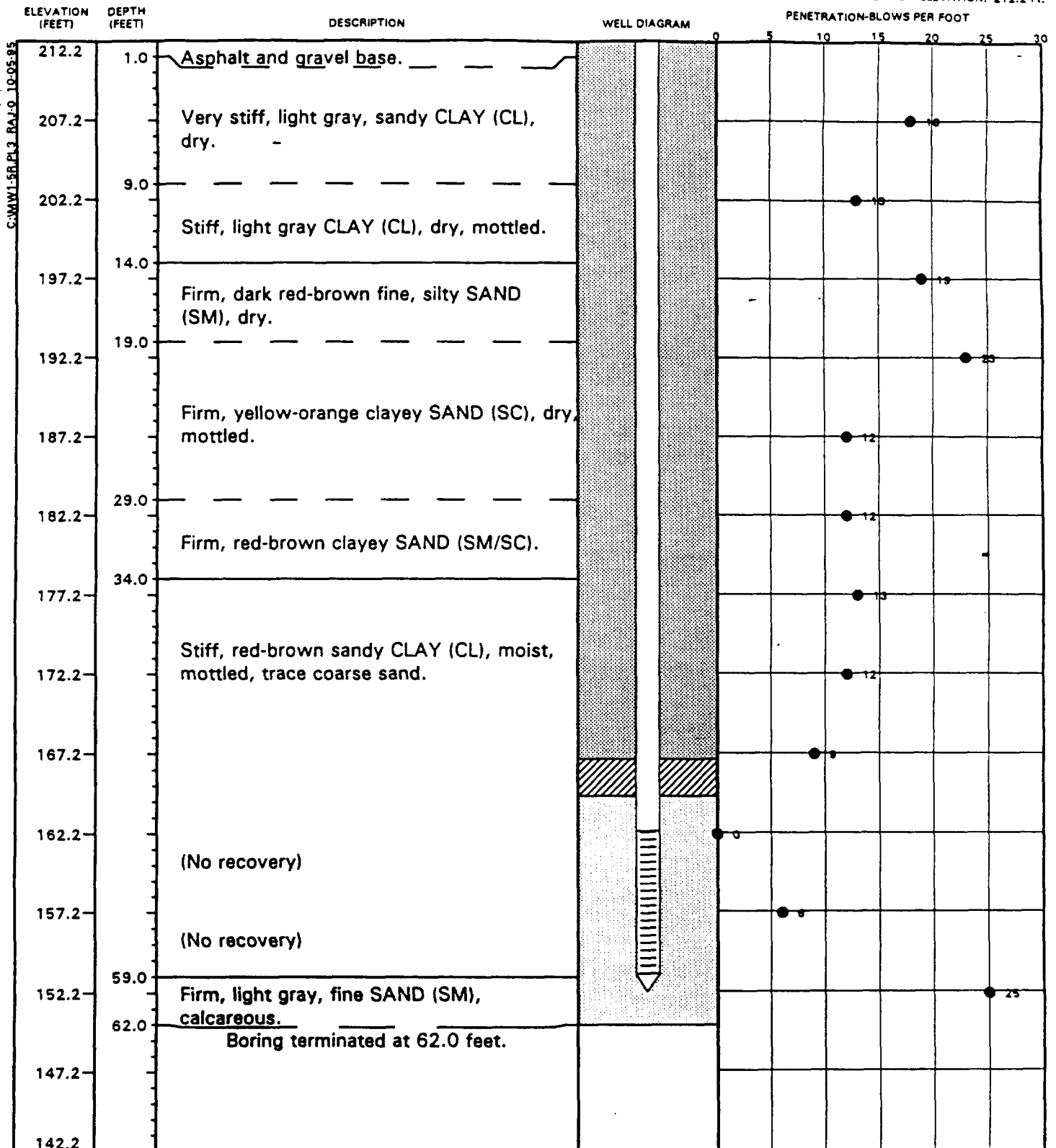
2) Boring advanced from 42.5 feet to 63 feet using 4 1/2" rock bit.

DRILLED BY M.H.
LOGGED BY G.R.
CHECKED BY J.M.
APPROVED BY E.S.

BORING NUMBER RW-10A
DATE STARTED 2/23/95
DATE COMPLETED 2/24/95
JOB NUMBER 41-4515

TEST BORING RECORD

6 2 0131

HEIGHT OF RISER: - 0.1 Ft.
DATUM ELEVATION: 212.2 Ft.

REMARKS:

- 1) Boring advanced to 62 feet using 4 1/4" I.D. hollow stem augers and split barrel sampler.

DRILLED BY R.B.
 LOGGED BY T.M.
 CHECKED BY J.M.
 APPROVED BY E.S.

BORING NUMBER MW-1-5A
 DATE STARTED 3/7/95
 DATE COMPLETED 3/7/95
 JOB NUMBER 41-4515

6 2 0132

ELEVATION (FEET)	DEPTH (FEET)	DESCRIPTION	WELL DIAGRAM	PENETRATION-BLOWS PER FOOT
				0 5 10 15 20 25 30 35 40 45 50
		Firm, red-brown and yellowish-orange clayey SAND (SM-SC), dry, trace of coarse SAND.		1
				18
	15.0	Very stiff, red-brown, sandy CLAY (CL).		21
	20.0	Very stiff, mottled red-brown and yellowish-orange sandy CLAY (CL), dry with trace of coarse SAND.		19
		(Light gray to white weathered sandstone, wet. No reaction to HCL).		46
	30.0	Stiff, mottled yellowish-orange and red-brown sandy CLAY (CL), moist.		11
	35.0	Stiff, red-brown, sandy CLAY (CL).		18
	38.0	Hard, dark brown CLAY (CL) with white calcareous SAND in bottom of sampler.		34
	40.0	Boring Terminated at 40.0 feet.		

BORING NUMBER	EMG-5AR
DATE STARTED	3/7/95
DATE COMPLETED	3/8/95
JOB NUMBER	41-4515

APPENDIX C
CHEMICAL DATA RESULT FORMS

Lab Sample ID: CSC170050001
Client Sample ID: BMW2A

Concentration: LOW
Sample Matrix: WATER
Percent Moisture:

Date Extracted:
Date Analyzed: 03/22
Dilution Factor:

VOLATILE COMPOUNDS

6 2 0134

CAS Number		ug/L	CAS Number	ug/L
5-15-0	Carbon Disulfide	2 J		

The Lab ID for data on this page is 1020322D.

REVIEWED BY: SHF
DATE: 3/24/95

0001006

6 2 0135

ORGANICS ANALYSIS DATA SHEET

Laboratory Name: QUANTERRA PITT
Lab Sample ID: C5E250014010
Client Sample ID: BMW2A

Concentration: LOW
Sample Matrix: WATER
Percent Moisture:

Date Extracted:
Date Analyzed: 06/01/95
Dilution Factor: 1.0

VOLATILE COMPOUNDS

<u>CAS Number</u>	<u>ug/L</u>	<u>CAS Number</u>	<u>ug/L</u>
75-15-0	Carbon Disulfide	10	U

The Lab ID for data on this page is 1060601N.

DATA ENTRY REVIEW

BY RJJ

JUNE 5, 1995 6/5/95
0001002

BMW-4

Lab Name: Quanteira Denver

Contract:

Lab Code:

Case No.: 40846

SAS No.:

SDG No.: 40846

Matrix: (soil/water) WATER

Lab Sample ID: 40846-08

Sample wt/vol:

5.0 (g/mL) mL

Lab File ID: H8894

Level: (low/med) LOW

Date Received: 03/04/95

% Moisture: not dec. _____

Date Analyzed: 03/07/95

GC Column: DB624

ID: 0.32 (mm)

Dilution Factor: 1.0

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____ (u

CAS NO.

COMPOUND

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

Q

75-15-0-----Carbon Disulfide

10.0 U

ORGANICS ANALYSIS DATA SHEET

6 2 0137

Laboratory Name: QUANTERRA PITT
Lab Sample ID: CSE260031037
Client Sample ID: BMW

Concentration: LOW
Sample Matrix: WATER
Percent Moisture:

Date Extracted:
Date Analyzed: 06/01/95
Dilution Factor: 1.0

VOLATILE COMPOUNDS

CAS Number	ug/L	CAS Number	ug/L
75-15-0	Carbon Disulfide	1	J

The Lab ID for data on this page is 1190601N.

DATA ENTRY REVIEW
BY PJJ *PJ*
JUNE 5, 1995 6/5/95

0002001

Lab Name: Quanterra Denver

6 2
Contract:

0138 0001008
EMG-7

Lab Code:

Case No.: 40868

SAS No.:

SDG No.: 40868

Matrix: (soil/water) WATER

Lab Sample ID: 40868-01

Sample wt/vol: 5.0 (g/mL) mL

Lab File ID: H8930

Level: (low/med) LOW

Date Received: 03/07/95

% Moisture: not dec. _____

Date Analyzed: 03/10/95

GC Column: DB624 ID: 0.32 (mm)

Dilution Factor: 1.0

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____ (uL)

CAS NO.

COMPOUND

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

Q

75-15-0-----Carbon Disulfide	35.8	
------------------------------	------	--

ORGANICS ANALYSIS DATA SHEET

6 2 0139

Laboratory Name: QUANTERRA PITT
Lab Sample ID: C5E260031036
Client Sample ID: EMG7

Concentration: LOW
Sample Matrix: WATER
Percent Moisture:

Date Extracted:
Date Analyzed: 06.01.05
Dilution Factor: 1.0

VOLATILE COMPOUNDS

CAS Number	ug/L	CAS Number	ug/L
75-15-0	Carbon Disulfide	10	U

The Lab ID for data on this page is 1180601N.

DATA ENTRY REVIEW
BY PJJ
JUNE 5, 1995 6/5/95

0002002

MW-7-8

Lab Name: Quanterra Denver

Contract:

Lab Code:

Case No.: 40846

SAS No.:

SDG No.: 40846

Matrix: (soil/water) WATER

Lab Sample ID: 40846-10

Sample wt/vol: 5.0 (g/mL) mL

Lab File ID: H8896

Level: (low/med) LOW

Date Received: 03/04/95

% Moisture: not dec. _____

Date Analyzed: 03/07/95

GC Column: DB624 ID: 0.32 (mm)

Dilution Factor: 1.0

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____ (

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
75-15-0-----	Carbon Disulfide	10.0	U

ORGANICS ANALYSIS DATA SHEET

6 2 0141

Laboratory Name: QUANTERRA PITT
Lab Sample ID: C5E250014012
Client Sample ID: MW78

Concentration: LOW
Sample Matrix: WATER
Percent Moisture:

Date Extracted:
Date Analyzed: 06/01/95
Dilution Factor: 1.0

VOLATILE COMPOUNDS

<u>CAS Number</u>	<u>ug/L</u>	<u>CAS Number</u>	<u>ug/L</u>
75-15-0	Carbon Disulfide	10	U

The Lab ID for data on this page is 1080601N.

DATA ENTRY REVIEW

BY PJJ

JUNE 5, 1995 6/5/95

0001010

ORGANICS ANALYSIS DATA SHEET

6 2 0149

Laboratory Name: QUANTERRA PITT
Lab Sample ID: C5E250014006
Client Sample ID: RW106

Concentration: LOW
Sample Matrix: WATER
Percent Moisture:

Date Extracted:
Date Analyzed: 06/01/95
Dilution Factor: 1.0

VOLATILE COMPOUNDS

CAS Number	ug/L	CAS Number	ug/L
75-15-0	Carbon Disulfide	1 JJ	

The Lab ID for data on this page is 1040601N.

DATA ENTRY REVIEW
BY PJJ SW 0001011
JUNE 5, 1995 6/5/95

ORGANICS ANALYSIS DATA SHEET

6 2

0143

Laboratory Name: QUANTERRA PITT
Lab Sample ID: CSE250014009
Client Sample ID: RW10AD

Concentration: LOW
Sample Matrix: WATER
Percent Moisture:

Date Extracted:
Date Analyzed: 06/01/99
Dilution Factor: 1.1

VOLATILE COMPOUNDS

<u>CAS Number</u>	<u>ug/L</u>	<u>CAS Number</u>	<u>ug/L</u>
75-15-0 Carbon Disulfide	1 J		

The Lab ID for data on this page is 1050601N.

DATA ENTRY REVIEW

BY PJJ SV

JUNE 5, 1999 6/5/99 0001012

VOLATILE ORGANICS ANALYSIS DATA SHEET

6 2

0145

DRW-11

Lab Name: Quanterra Denver

Contract:

Lab Code:

Case No.: 40846

SAS No.:

SDG No.: 40846

Matrix: (soil/water) WATER

Lab Sample ID: 40846-03

Sample wt/vol: 5.0 (g/mL) mL

Lab File ID: H8890

Level: (low/med) LOW

Date Received: 03/04/95

% Moisture: not dec. _____

Date Analyzed: 03/07/95

GC Column: DB624 ID: 0.32 (mm)

Dilution Factor: 1.0

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
---------	----------	--	---

75-15-0-----	Carbon Disulfide		
--------------	------------------	--	--

10.0 U

DRW-11D

Lab Name: Quanterra Denver

Contract:

Lab Code:

Case No.: 40846

SAS No.:

SDG No.: 40846

Matrix: (soil/water) WATER

Lab Sample ID: 40486-05

Sample wt/vol: 5.0 (g/mL) mL

Lab File ID: H8892

Level: (low/med) LOW

Date Received: 03/04/95

% Moisture: not dec. _____

Date Analyzed: 03/07/95

GC Column: DB624 ID: 0.32 (mm)

Dilution Factor: 1.0

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
---------	----------	--	---

75-15-0-----Carbon Disulfide	10.0	U
------------------------------	------	---

ORGANICS ANALYSIS DATA SHEET

6 2 0147

Laboratory Name: QUANTERRA PITT
Lab Sample ID: CSE250014014
Client Sample ID: DRW11

Concentration: LOW
Sample Matrix: WATER
Percent Moisture:

Date Extracted:
Date Analyzed: 06/01/95
Dilution Factor: 1.0

VOLATILE COMPOUNDS

<u>CAS Number</u>	<u>ug/L</u>	<u>CAS Number</u>	<u>ug/L</u>
75-15-0	Carbon Disulfide	10	U

The Lab ID for data on this page is 1100601N.

DATA ENTRY REVIEW

BY PJJ

JUNE 5, 1995 6/5/95

0001003

VOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name: Quanterra Denver

Contract:

6 2

0148

FB-0227A

Lab Code:

Case No.: 40846

SAS No.:

SDG No.: 40846

Matrix: (soil/water) WATER

Lab Sample ID: 40486-04

Sample wt/vol: 5.0 (g/mL) mL

Lab File ID: H8891

Level: (low/med) LOW

Date Received: 03/04/95

% Moisture: not dec. _____

Date Analyzed: 03/07/95

GC Column: DB624 ID: 0.32 (mm)

Dilution Factor: 1.0

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____ (

CAS NO.

COMPOUND

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

Q

75-15-0-----Carbon Disulfide

1.27 J

VOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name: Quanterra Denver

6 2 0149
Contract:

FB-0228A

Lab Code:

Case No.: 40846

SAS No.:

SDG No.: 40846

Matrix: (soil/water) WATER

Lab Sample ID: 40846-13

Sample wt/vol: 5.0 (g/mL) mL

Lab File ID: H8899

Level: (low/med) LOW

Date Received: 03/04/95

% Moisture: not dec. _____

Date Analyzed: 03/07/95

GC Column: DB624 ID: 0.32 (mm)

Dilution Factor: 1.0

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____ (uL)

CAS NO.

COMPOUND

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

Q

75-15-0-----Carbon Disulfide

10.0 U

VOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name: Quanterra Denver

6 2
Contract:

0150

FB-0228B

Lab Code:

Case No.: 40846

SAS No.:

SDG No.: 40846

Matrix: (soil/water) WATER

Lab Sample ID: 40846-07

Sample wt/vol: 5.0 (g/mL) mL

Lab File ID: H8893

Level: (low/med) LOW

Date Received: 03/04/95

% Moisture: not dec. _____

Date Analyzed: 03/07/95

GC Column: DB624 ID: 0.32 (mm)

Dilution Factor: 1.0

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____

CAS NO.

COMPOUND

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

Q

75-15-0-----Carbon Disulfide

10.0 U

Lab Name: Quanterra Denver

Contract: 62

0151

FB-0228C

Lab Code:

Case No.: 40846

SAS No.:

SDG No.: 40846

Matrix: (soil/water) WATER

Lab Sample ID: 40846-12

Sample wt/vol: 5.0 (g/mL) mL

Lab File ID: H8898

Level: (low/med) LOW

Date Received: 04/13/94

‡ Moisture: not dec. _____

Date Analyzed: 03/07/95

GC Column: DB624 ID: 0.32 (mm)

Dilution Factor: 1.0

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/Kg)	ug/L
75-15-0-----	Carbon Disulfide	10.0	U

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA METHOD 8260 U.

Lab Name: Quanterra Denver

Contract:

6 2

0152

FB-0228D

Lab Code:

Case No.: 40846

SAS No.:

SDG No.: 40846

Matrix: (soil/water) WATER

Lab Sample ID: 40846-11

Sample wt/vol: 5.0 (g/mL) mL

Lab File ID: H8897

Level: (low/med) LOW

Date Received: 03/04/95

% Moisture: not dec. _____

Date Analyzed: 03/07/95

GC Column: DB624 ID: 0.32 (mm)

Dilution Factor: 1.0

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____ (uL)

CAS NO.

COMPOUND

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

Q

75-15-0-----Carbon Disulfide

10.0 U

Lab Name: Quanterra Denver

6 2
Contract:

0153

FB-0228E

Lab Code:

Case No.: 40846

SAS No.:

SDG No.: 40846

Matrix: (soil/water) WATER

Lab Sample ID: 40846-09

Sample wt/vol: 5.0 (g/mL) mL

Lab File ID: H8895

Level: (low/med) LOW

Date Received: 03/04/95

* Moisture: not dec. _____

Date Analyzed: 03/07/95

GC Column: DB624 ID: 0.32 (mm)

Dilution Factor: 1.0

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____ (uL)

CAS NO.

COMPOUND

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

Q

75-15-0-----Carbon Disulfide	10.0	U
------------------------------	------	---

Lab Name: Quanterra Denver

Contract: 6 2

0154

0001010
FB-0301

Lab Code:

Case No.: 40868

SAS No.:

SDG No.: 40868

Matrix: (soil/water) WATER

Lab Sample ID: 40868-03

Sample wt/vol: 5.0 (g/mL) mL

Lab File ID: H8934

Level: (low/med) LOW

Date Received: 03/07/95

% Moisture: not dec. _____

Date Analyzed: 03/10/95

GC Column: DB624 ID: 0.32 (mm)

Dilution Factor: 1.0

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____ (u

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
---------	----------	--	---

75-15-0-----Carbon Disulfide	10.0	U
------------------------------	------	---

Lab Sample ID: CSC170050002
Client Sample ID: FB0314

Concentration: LOW
Sample Matrix: WATER
Percent Moisture:

Date Extracted:
Date Analyzed: 03/23/
Dilution Factor: 1

VOLATILE COMPOUNDS

6 2 0155

CAS Number	ug/L	CAS Number	ug/L
5-15-0 Carbon Disulfide	10 U		

The Lab ID for data on this page is 10503220.

REVIEWED BY: EMF
DATE: 3/24/05

0001012

6 2

0156

0001009
RB-0302

Lab Name: Quanterra Denver

Contract:

Lab Code:

Case No.: 40868

SAS No.:

SDG No.: 40868

Matrix: (soil/water) WATER

Lab Sample ID: 40868-02

Sample wt/vol: 5.0 (g/mL) mL

Lab File ID: H8933

Level: (low/med) LOW

Date Received: 03/07/95

% Moisture: not dec. _____

Date Analyzed: 03/10/95

GC Column: DB624 ID: 0.32 (mm)

Dilution Factor: 1.0

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
---------	----------	--	---

75-15-0-----Carbon Disulfide	10.0	U
------------------------------	------	---

Lab Name: Quanterra Denver

Contract:

6 2

0107

TB-0228

Lab Code:

Case No.: 40846

SAS No.:

SDG No.: 40846

Matrix: (soil/water) WATER

Lab Sample ID: 40846-14

Sample wt/vol: 5.0 (g/mL) mL

Lab File ID: H8900

Level: (low/med) LOW

Date Received: 03/04/95

% Moisture: not dec. _____

Date Analyzed: 03/07/95

GC Column: DB624 ID: 0.32 (mm)

Dilution Factor: 1.0

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
---------	----------	--	---

75-15-0-----Carbon Disulfide	10.0	U
------------------------------	------	---

ORGANICS ANALYSIS DATA SHEET

6 2 0158

Laboratory Name: QUANTERRA PITT
Lab Sample ID: C5E250014013
Client Sample ID: FB0522

Concentration: LOW
Sample Matrix: WATER
Percent Moisture:

Date Extracted:
Date Analyzed: 06/01/95
Dilution Factor: 1.0

VOLATILE COMPOUNDS

CAS Number	ug/L	CAS Number	ug/L
75-15-0	Carbon Disulfide	10	U

The Lab ID for data on this page is 1090601N.

DATA ENTRY REVIEW

BY PJJ
0001006
JUNE 9, 1995 6/5/95

ORGANICS ANALYSIS DATA SHEET

6 2 0159

Laboratory Name: QUANTERRA PITT
Lab Sample ID: CSE250014007
Client Sample ID: FB0523A

Concentration: LOW
Sample Matrix: WATER
Percent Moisture:

Date Extracted:
Date Analyzed: 06/01/95
Dilution Factor: 1.0

VOLATILE COMPOUNDS

<u>CAS Number</u>	<u>ug/L</u>	<u>CAS Number</u>	<u>ug/L</u>
75-15-0	Carbon Disulfide	10	U

The Lab ID for data on this page is 1030601N.

DATA ENTRY REVIEW

B0001007

JUNE 5, 1995 6/5/95

ORGANICS ANALYSIS DATA SHEET

6 2 0160

Laboratory Name: QUANTERRA PITT
Lab Sample ID: C5E250014011
Client Sample ID: FB05238

Concentration: LOW
Sample Matrix: WATER
Percent Moisture:

Date Extracted:
Date Analyzed: 06/01/95
Dilution Factor: 1.0

VOLATILE COMPOUNDS

<u>CAS Number</u>	<u>ug/L</u>	<u>CAS Number</u>	<u>ug/L</u>
75-15-0	Carbon Disulfide 10 U		

The Lab ID for data on this page is 1070601N.

DATA ENTRY REVIEW

BY PJJ

JUN 06 1995 6/5/95

ORGANICS ANALYSIS DATA SHEET

6 2 0161

Laboratory Name: QUANTERRA PITT
Lab Sample ID: CSE250014015
Client Sample ID: FB0523C

Concentration: LOW
Sample Matrix: WATER
Percent Moisture:

Date Extracted:
Date Analyzed: 06/01/95
Dilution Factor: 1.0

VOLATILE COMPOUNDS

<u>CAS Number</u>	<u>ug/L</u>	<u>CAS Number</u>	<u>ug/L</u>
75-15-0	Carbon Disulfide	10	U

The Lab ID for data on this page is 1130601N.

DATA ENTRY REVIEW

BY PJJJUNE 5, 1995 6/5/95

0001009

ORGANICS ANALYSIS DATA SHEET

6 2 0162

Laboratory Name: QUANTERRA PITT
Lab Sample ID: CSE260031038
Client Sample ID: FB052-B

Concentration: LOW
Sample Matrix: WATER
Percent Moisture:

Date Extracted:
Date Analyzed: 06/01/95
Dilution Factor: 1.0

VOLATILE COMPOUNDS

CAS Number	ug/L	CAS Number	ug/L
75-15-0	Carbon Disulfide 10 U		

The Lab ID for data on this page is 1200601N.

DATA ENTRY REVIEW

BY (PJJ) *PL*

JUNE 5, 1995 6/5/95

0002003

ORGANICS ANALYSIS DATA SHEET

6 2 0163

Laboratory Name: QUANTERRA PITT
Lab Sample ID: CSE260031039
Client Sample ID: FB05240

Concentration: LOL
Sample Matrix: WATER
Percent Moisture:

Date Extracted:
Date Analyzed: 06-06-95
Dilution Factor: 1.0

VOLATILE COMPOUNDS

<u>CAS Number</u>	<u>ug/L</u>	<u>CAS Number</u>	<u>ug/L</u>
75-15-0	Carbon Disulfide	10	U

The Lab ID for data on this page is 1050602D.

DATA ENTRY REVIEW

BY PJJ *[Signature]*

JUNE 5, 1995 *6/5/95*

0002004

ORGANICS ANALYSIS DATA SHEET

6 2 0164

Laboratory Name: QUANTERRA CITY
Lab Sample ID: CSE260031040
Client Sample ID: RB0525

Concentration: LOW
Sample Matrix: WATER
Percent Moisture:

Date Extracted:
Date Analyzed: 06-06-95
Dilution Factor: 1.0

VOLATILE COMPOUNDS

CAS Number	ug/L	CAS Number	ug/L
75-15-0	Carbon Disulfide	10	U

The Lab ID for data on this page is 10406020.

DATA ENTRY REVIEW
BY PJJ *AW*
JUNE 5, 1995 6/5/95

0002005

ORGANICS ANALYSIS DATA SHEET

6 2 0165

Laboratory Name: QUANTERRA PITT
Lab Sample ID: CSE250014006
Client Sample ID: TR0524

Concentration: LOW
Sample Matrix: WATER
Percent Moisture:

Date Extracted:
Date Analyzed: 06/01/95
Dilution Factor: 1.0

VOLATILE COMPOUNDS

<u>CAS Number</u>	<u>ug/L</u>	<u>CAS Number</u>	<u>ug/L</u>
75-15-0	Carbon Disulfide	10	U

The Lab ID for data on this page is 1010601N.

10/2.1

ORGANICS ANALYSIS DATA SHEET

6 2 0166

Laboratory Name: QUANTERRA PITT
Lab Sample ID: CSE260031035
Client Sample ID: TR0525

Concentration: LOW
Sample Matrix: WATER
Percent Moisture:

Date Extracted:
Date Analyzed: 06/01/95
Dilution Factor: 1.0

VOLATILE COMPOUNDS

CAS Number	ug/L	CAS Number	ug/L
75-15-0	Carbon Disulfide	10	U

The Lab ID for data on this page is 1170601N.

DATA ENTRY REVIEW

BY PJJ *PJJ*

JUNE 5, 1995 *6/5/95*

2007.1

BMW24

SDG No. : LAW01

Lab Sample ID: CSC17005000

Date received: 03/11/75

u. u

Concentration Units (ug/L or mg/kg dry weight): UG/L

[illegible]

Texture: _____

HRT 1 Facts: _____

BMW-24

DATE	DESCRIPTION	AMOUNT	CHECK NO.	BANK	INITIALS
10/1/58
10/2/58
10/3/58
10/4/58
10/5/58
10/6/58
10/7/58
10/8/58
10/9/58
10/10/58
10/11/58
10/12/58
10/13/58
10/14/58
10/15/58
10/16/58
10/17/58
10/18/58
10/19/58
10/20/58
10/21/58
10/22/58
10/23/58
10/24/58
10/25/58
10/26/58
10/27/58
10/28/58
10/29/58
10/30/58
10/31/58
TOTALS					

ILMO3. 0

000200:

62 0168

INORGANIC ANALYSES DATA SHEET

Lab Name: QUANTERRA_PITTSBURGH_____ Contract: LAW

BMWCAF

Lab Code: QUESPH_ Case No.: 63036_ SAS No.: _____ SUB No.: LHW01

Matrix (soil/water): WHIER

Lab Sample ID: USC1/00000000

Level (low/med): LOW

Date Received: 03/17/95

7 SOLIDS: W. W.

Concentration Units (ug/L or mg/kg dry weight): ug/L

[illegible]

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color Matter: YELLOW_____ Clarity Matter: CLEAR_____ Artifacts: _____

Comments:

BMW-ՀԻԼ

DISSOLVEDS

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BMW-2A

Lao Name: QUANTERRA_PITTSBURGH_____ Contract: LAW_____

Lab Code: QPITT Case No.: 63036 SAS No.: SDG No.: LAW02

Matrix (soil/water): WATER

Lab Sample ID: C5E250014002

Level (low/med): LOW

Date Received: 05/25/95

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

[illegible]

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

TOTAL METALS ANALYSIS

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BMW2AD

Lab Name: QUANTERRA_PITTSBURGH Contract: LAW

Lab Code: QPITT_ Case No.: 63036_ SAS No.: _____ SDG No.: LAW02

Matrix (soil/water): WATER

Lab Sample ID: C5E250014003

Level (low/med): LOW

Date Received: 05/25/95

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

[illegible]

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

TOTAL_METALS_ANALYSIS

0001146

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BMW3AF

Lab Name: QUANTERRA_PITTSBURGH Contract: LAW

Lab Code: QPITT Case No.: 63036 SAS No.: SDG No.: LAW02

Matrix (soil/water): WATER

Lab Sample ID: C5E250014001

Level (low/med): LOW

Date Received: 05/25/95

% Solias: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

[illegible]

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

DISSOLVED_METALS_ANALYSIS_____

0001147

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BMW2AFD

Lab Name: QUANTERRA_PITTSBURGH_____ Contract: LAW_____

Lab Code: QPITT_ Case No.: 63036_ SAS No.: _____ SDG No.: LAW02_

Matrix (soil/water): WATER

Lab Sample ID: CSEES0014004

Level (low/med): LOW__

Date Received: 05/25/95

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

[illegible]

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

DISSOLVED_METALS_ANALYSIS_____

BMW-3F

Lab Sample ID: CSC040021032

Date Received: 03/04/95

Concentration Units (ug/L or mg/kg dry weight): UG/L

ILM03.0

EPA SAMPLE NO.

BMW3F

Contract: LAW

Case No. : 4515

SAS No. :

SDG No. : LAW03

Lab Sample ID: CSE260031025

Date Received: 05/26/95

0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

f

Texture:

Artifacts:

EMG-2

Lab Code: QESPA_ Case No.: 41575_ SAS No.: _____ SDG No.: BMW-3_

Lab Sample ID: C5C04002100.

Date Received: 03/04/95

* Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

[illegible]

Texture: _____

Artifacts: _____

TOTAL _____

EPA SAMPLE NO.

EMGE

Contract: LAW

Case No. : 4515

SAS No. :

SDG No. : LAW03

Lab Sample ID: C5E260031007

Date Received: 05/26/95

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

[illegible]

Clarity Before: CLEAR_

Texture: _____

Clarity After: CLEAR

Artifacts: _____

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

EMGEF

Lab Name: QUANTERRA_PITTSBURGH_____ Contract: LAW_____

Lab Code: QESPA_ Case No.: 4515_ SAS No.: _ SDG No.: LAW03_

Matrix (soil/water): WATER Lab Sample ID: C5E260031008

Level (low/med): LOW__ Date Received: 05/26/95

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

[illegible]

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

2140.1

EMG-6

Lab Name: QUANTERRA_PITTSBURGH_____ Contract: LAW_____

Lab Code: QESPA_ Case No.: 41575_ SAS No.: _____ SDG No.: BMW-3_

Matrix (soil/water): WATER

Lab Sample ID: CSC040021001

Level (low/med): LOW__

Date Received: 03/04/95

% Solids: 0.0

Concentration Units (ug/L or ug/kg dry weight): UG/L_

[illegible]

Color Before: COLORLESS

Clarity Before: CLEAR_

Texture: _____

Color After: COLORLESS

Clarity After: CLEAR_

Artifacts: _____

Comments:

TOTAL _____

EDAL SAMPLE NO.

Contract: LAW

EMG-6F

SDG No. : BMW-3_

Lao Sample ID: CSC040021003

Date Received: 03/04/95

* Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

DISSOLVED

EPA SAMPLE NO.

EMG6

SDG No. : LAW03

Lab Sample ID: C5E260031009

Date Received: 05/26/95

0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

[illegible]

Texture:

Artifacts: _____

U.S. EPA - CLF

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

EMG6D

Lab Name: QUANTERRA_PITTSBURGH_____ Contract: LAW_____

Lab Code: QESPA_ Case No.: 4515 SAS No.: SDG No.: LAW03

Matrix (soil/water): WATER

Lab Sample ID: CSE260031010

Level (low/med): LOW

Date Received: 05/26/95

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

[illegible]

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

EPA SAMPLE NO.

EMG6FD

% Solids: 0.0

[illegible]

Comments:

EMG-7

Lab Name: QUANTERRA_PITTSBURGH_____ Contract: LAW_____

Lab Code: QESPA_ Case No.: 41575_ SAS No.: _____ SDG No.: BMW-3_

Matrix (soil/water): WATER

Lab Sample ID: C5C040021014

Level (low/med): LOW__

Date Received: 03/04/95

* Solinas: 0.0

Concentration Units (ug/L or ug/kg dry weight): UG/L_

[illegible]

Color Before: COLORLESS

Clarity Before: CLEAR_

Texture: _____

Color After: COLORLESS

Clarity After: CLEAR_

Artifacts: _____

Comments:

TOTAL

EMG-7F

Lab Sample ID: C5C040021015

Date Received: 03/04/95

Concentration Units (ug/L or mg/kg dry weight): UG/L

ILM03.0

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

EMG7F

Lab Name: QUANTERRA_PITTSBURGH_____ Contract: LAW_____

Lab Code: QESPA_ Case No.: 4515_ SAS No.: _ SDG No.: LAW03_

Matrix (soil/water): WATER

Lab Sample ID: CSE260031014

Level (low/med): LOW__

Date Received: 05/26/95

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

[illegible]

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

6 2

0192

MW-1-2F

Contract: LAW

Case No. : 41575_

SAS No. :

SDG No. : BMW-3_

Lab Sample ID: C5C040021008

Date Received: 03/04/95

* Solinas: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

[illegible]

Clarity Before: CLEAR_

Texture: _____

Clarity After: CLEAR_

Artifacts: _____

Comments:

DISSOLVED

EPA SAMPLE NO.

MW 13

SDG No. : LAW03_

Lab Sample ID: C5EE60031034

Date Received: 05/26/95

0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

19

Texture:

Artifacts:

Lab Name: QUANTERRA_PITTSBURGH_____ Contract: LAW_____

MW-1-3

Lab Code: QESPA_ Case No.: 41575_ SAS No.: _____ SDG No.: BMW-3

Matrix (soil/water): WATER

Lab Sample ID: C5C040021005

Level (low/med): LOW

Date Received: 03/04/95

% Solinas: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

[illegible]

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: **COLORLESS** Clarity After: **CLEAR** Artifacts: _____

Comments:

TOTAL _____

% Solids: 0.0

Concentration Units (ug/L or ug/kg dry weight): UG/L_

DISSOLVED

EPA SAMPLE NO.

0002150 ILM03.0

EPA SAMPLE NO.

MW13F

SDG No. : LAW03_

Lab Sample ID: CSE260031028

Date Received: 05/26/95

0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

[illegible]

Texture: _____

Artifacts: _____

MW-1-4

SDG No. : BMW-3

Lab Sample ID: C5C040021013

Date Received: 03/04/95

Concentration Units (ug/L or mg/kg dry weight): UG/L

TOTAL

INORGANIC ANALYSES DATA SHEET

MW-1-4F

SDG No. : BMW-3

Lab Sample ID: CSC040021021

Date Received: 03/04/95

0.0

: UG/L_

[illegible]

Texture: _____

Artifacts: _____

DISSOLVED

U.S. EFA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

Lab Name: QUANTERRA_PITTSBURGH Contract: LAW

MW 14

Lab Code: QESPA Case No.: 4515 SAS No.: SDG No.: LAW03

Matrix (soil/water): WATER

Lab Sample ID: CSE260031019

Level (low/med): LOW

Date Received: 05/26/95

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

[illegible]

Color Before: COLORLESS

Clarity Before: CLEAR_

Texture:

Color After: COLORLESS

Clarity After: CLEAR

Artifacts:

Comments:

Lab Name: QUANTERRA_PITTSBURGH_____ Contract: LAW

מלכא

Lab Code: QESPA_ Case No.: 63036_ SAS No.: SDG No.: LAW01

Matrix (soil/water): WHIEK

Lao sample ID: LSC1/MSA00000

Level (low/med): LUW

Date Received: 03/11/95

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): ug/L

[illegible]

Color before: COLORLESS

Clarity Before: CLEAR

Texture:

Color After: COLORLESS

Clarity After: CLEAR_

Artifacts:

Comments:

17W-1-JH

TOTALS

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MW15AF

Lab Name: QUANTERRA_PITTSBURGH_____ Contract: LAW_____

Lab Code: QESPA_ Case No.: 4515_ SAS No.: _ SDG No.: LAW03_

Matrix (soil/water): WATER

Lab Sample ID: CSE260031005

Level (low/med): LOW

Date Received: 05/26/95

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

[illegible]

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

MW16A

SUB NO. : LHW01

Lab Sample ID: CSCI/MSWS

Date Received: 03/17/95

u. u

Concentration Units (ug/L or mg/kg dry weight): UG/L

[illegible]

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color Httcr: CULUMLESS Clarity Httcr: CLEAK Httfracts: _____

COMMENTS:

HW-1-MW

DATE	DESCRIPTION	AMOUNT	CHECK NO.	BANK	INITIALS
12-1-58
12-2-58
12-3-58
12-4-58
12-5-58
12-6-58
12-7-58
12-8-58
12-9-58
12-10-58
12-11-58
12-12-58
12-13-58
12-14-58
12-15-58
12-16-58
12-17-58
12-18-58
12-19-58
12-20-58
12-21-58
12-22-58
12-23-58
12-24-58
12-25-58
12-26-58
12-27-58
12-28-58
12-29-58
12-30-58
12-31-58
TOTALS					

MW 1644

Lab Sample ID: C5C1/00000000

Date Received: 03/17/95

Concentration Units (ug/L or mg/kg dry weight): UG/L

000200-

0002158 ILM03.0

EPA SAMPLE NO. 012

Lab Name: QUANTERRA_PITTSBURGH Contract: LAW

Lab Code: QESPA_ Case No.: 414515 SAS No.: SDG No.: DRW-11

Lab Sample ID: CSC020030020

Date Received: 03/02/95

Concentration Units (ug/L or mg/kg dry weight): UG/L

ILM03.0

MW-7-SF

SDG No. : DRW-11

Lab Sample ID: C5C020030015

Date Received: 03/02/95

Concentration Units (ug/L or mg/kg dry weight): UG/L

ILM03.0

Lab Name: QUANTERRA_PITTSBURGH Contract: LAW

MW75FD

Lab Code: QESPA_ Case No.: 414515 SAS No.: _____ SDG No.: DRW-11

Matrix (soil/water): WATER

Lab Sample ID: C5C020030016

Level (low/med): LOW

Date Received: 03/02/95

% Solids: 0.0

Concentration Units (ug/L or ug/kg dry weight): UG/L

[illegible]

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

MW-7-SFD

Lab Name: QUANTERRA_PITTSBURGH_____ Contract: LAW_____

MM-14

Lab Code: QESPA_ Case No.: 414515 SAS No.: SDG No.: DRW-11

Matrix (soil/water): WATER

Lab Sample ID: C5C020030003

Level (low/med): LDW

Date Received: 03/02/95

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

[illegible]

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MW14

Lab Name: QUANTERRA_PITTSBURGH_____ Contract: LAW_____

Lab Code: QESFA Case No.: 4515 SAS No.: SDG No.: LAW03

Matrix (soil/water): WATER

Lab Sample ID: C5E260031004

Level (low/med): LOW

Date Received: 05/26/95

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

[illegible]

Color before: COLORLESS

Clarity Before: CLEAR_

Texture:

Color After: COLORLESS

Clarity After: CLEAR_

Artifacts: _____

Comments:

RW-3F

SDG No. : DRW-11

Lab Sample ID: C5C020030002

Date Received: 03/02/95

Concentration Units (ug/L or mg/kg dry weight): UG/L

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____
Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____
Comments: _____

EMG-3F

Lab Name: QUANTERRA_PITTSBURGH_____ Contract: LAW

Lab Code: QESPA_ Case No.: 41575_ SAS No.: _____ SDG No.: BMW-3

Matrix (soil/water): WATER

Lab Sample ID: CSC040021016

Level (low/med): LOW

Date Received: 03/04/95

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

[illegible]

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

DISSOLVED

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

EMGSF

Lab Name: QUANTERRA_PITTSBURGH_____ Contract: LAW_____

Lab Code: QESPA_ Case No.: 4515_ SAS No.: _ SDG No.: LAW03_

Matrix (soil/water): WATER

Lab Sample ID: CSE260031031

Level (low/med): LOW__

Date Received: 05/26/95

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

[illegible]

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

RW10AF

Lab Name: QUANTERRA_PITTSBURGH_____ Contract: LAW_____

Lab Code: QESPA Case No.: 4515 SAS No.: SDG No.: LAW03

Matrix (soil/water): WATER

Lab Sample ID: CSE260031018

Level (low/med): LOW

Date Received: 05/26/95

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

[illegible]

Color Before: COLORLESS

Clarity Before: CLEAR_

Texture: _____

Color After: COLORLESS

Clarity After: CLEAR

Artifacts:

Comments:

DRW-5

Lap Name: QUANTERRA_PITTSBURGH _____ Contract: LAW _____

Lap Code: QESPA_ Case No.: 41575_ SAS No.: _____ SDG No.: BMW-3_

Lab Sample ID: C5C040021011

Date Received: 03/04/95

matrix (soil/water): WATER

Level (low/med): LOW__

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

[illegible]

Color Before: COLORLESS

Clarity Before: CLEAR_

Texture: _____

Color After: COLORLESS

Clarity After: CLEAR_

Artifacts: _____

Comments:

TOTAL _____

OWN SOUND BOARD.

DRW-SF

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

ILM03.0

6 2 0235

EPA SAMPLE NO.

1

INORGANIC ANALYSES DATA SHEET

DRW-5

Lab Name: QUANTERRA_PITTSBURGH_____ Contract: LAW_____

Lab Code: QPITT_ Case No.: 63036_ SAS No.: _____ SDG No.: LAW02_

Matrix (soil/water): WATER

Lab Sample ID: C5E250014020

Level (low/med): LOW__

Date Received: 05/25/95

* Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

[illegible]

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

TOTAL_METALS_ANALYSIS _____

EPA SAMPLE NO.

DRW-EF

Lab Sample ID: C5E250014021

Date Received: 05/25/95

Concentration Units (ug/L or mg/kg dry weight): UG/L

DISSOLVED METALS ANALYSIS

0001150

6 2

0237

Lab Name: QUANTERRA_PITTSBURGH

Contract: LAW

DRW-11

Lab Code: QESPA

Case No. : 414515

SAS No. : _____

SDG No. : DRW-11

Matrix (soil/water): WATER

Lab Sample ID: C5C020030006

Level (low/med): - LOW

Date Received: 03/02/93

% Solids: 0.0

Concentration Units (ug/L or ng/kg dry weight): UG/L

[illegible]

Color Before: COLORLESS

Clarity Before: CLEAR_

Texture: _____

Color Matter: COLORLESS

Clarity After: CLEAR_

Artifacts: _____

Comments:

SAMPLE NO. 77

DRW-11D

DRW11F

Contract: LAW

SDG No. : DRW-11

Lab Sample ID: CSC020030007

Date Received: 03/02/95

* Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

DRW-11F _____

EPA SAMPLE NO. 0007

6 2 0240

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

DRW11F

Lab Name: QUANTERRA_PITTSBURGH_____ Contract: LAW_____

Lab Code: QESPA_ Case No.: 4515_ SAS No.: _ SDG No.: LAW03_

Matrix (soil/water): WATER

Lab Sample ID: C5E260031015

Level (low/med): LOW__

Date Received: 05/26/95

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

[illegible]

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

Lab Name: QUANTERRA_PITTSBURGH Contract: LAW

OW-2F

Lab Code: QESPA_ Case No.: 414515 SAS No.: SDG No.: DRW-11

Matrix (soil/water): WATER

Lab Sample ID: CSC020030013

Level (low/med): - LOW

Date Received: 03/02/95

* Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

[illegible]

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

EPA SAMPLE NO.

OW-2

% Solids: 0.0

[illegible]

TOTAL_METALS_ANALYSIS

0001152

Lab Name: QUANTERRA_PITTSBURGH Contract: LAW

OW-2F

Lab Code: QPITT_ Case No.: 63036_ SAS No.: _____ SDG No.: LAW02_

Matrix (soil/water): WATER

Lab Sample ID: C5E250014017

Level (low/med): LOW

Date Received: 05/25/95

% Solias: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

[illegible]

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

DISSOLVED METALS ANALYSIS

0001153

EDPA SAMPLE NO.

PW-1

Concentration Units (ug/L or mg/kg dry weight): UG/L_

[illegible]

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

TOTAL _____

PW-1F

Lab Sample ID: CSC04002101

Date Received: 03/04/95

Concentration Units (ug/L or mg/kg dry weight): UG/L

ILM03.0

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

PW-1

Lab Name: QUANTERRA PITTSBURGH Contract: LAW

Lab Code: QPITT_ Case No.: 63036_ SAS No.: _____ SDG No.: LAW02

Matrix (soil/water): WATER

Lab Sample ID: C5E250014018

Level (low/med): LOW

Date Received: 05/25/95

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

[illegible]

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

TOTAL METALS ANALYSIS

0001154

INORGANIC ANALYSES DATA SHEET

Lab Name: QUANTERRA_PITTSBURGH_____ Contract: LAW_____

EW-1F

Lab Code: QPITT_ Case No.: 63036_ SAS No.: _____ SDG No.: LAW02_

Matrix (soil/water): WATER

Lab Sample ID: C5E250014016

Level (low/med): LOW__

Date Received: 05/25/95

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

[illegible]

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

DISSOLVED_METALS_ANALYSIS_____

FB0227A

Lab Name: QUANTERRA_PITTSBURGH Contract: LAW

Lab Code: QESPA_ Case No.: 414515 SAS No.: _____ SDG No.: DRW-11

Matrix (soil/water): WATER

Lab Sample ID: C5C020030009

Level (low/med): - Low

Date Received: 03/02/95

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

[illegible]

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

FB-0227A

FB0228B

SDG No. : DRW-11

Lab Sample ID: C5C020030018

Date Received: 03/02/95

0.0

ght): UG/L

[illegible]

Clarity Before: CLEAR

Texture: _____

Clarity After: CLEAR

Artifacts: _____

၇၆-မင်းသိင်္ခ

1

INORGANIC ANALYSES DATA SHEET

Lab Name: QUANTERRA_PITTSBURGH_____ Contract: LAW _____

FB0524A

Lab Code: QPITT_ Case No.: 63036_ SAS No.: _____ SDG No.: LAW02

Matrix (soil/water): WATER

Lab Sample ID: CSE250014005

Level (low/med): LOW

Date Received: 05/25/95

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

[illegible]

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

TOTAL_METALS_ANALYSIS

0001151

0002161 ILM03.0

EFA SAMPLE NO.

RB0525F

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

[illegible]

Comments: